DOCUMENT RESUME

ED 184 106 CS 005 358

AUTHOR Allan, Karen Kuelthau
TITLE The Development of Young Children's Metalinguistic Understanding of "Letter," "Word," and "Sentence."
INSTITUTION Wisconsin Univ., Madison. Research and Development Center for Individualized Schooling.
SPONS AGENCY National Inst. of Education (DHEW), Washington, D.C.
REPORT NO WRDCIS-TR-531
PUB DATE Dec 79
GRANT OB-NIE-G-80-0117
NOTE 274p.

EDRS PRICE MF01/PC11 Plus Postage.
DESCRIPTORS *Beginning Reading; *Decoding (Reading); Developmental Stages; Early Childhood Education; Reading Ability; Reading Readiness; Reading Research; *Reading Skills; *Recognition (Psychology); *Sentences; *Word Recognition; Young Children
IDENTIFIERS *Metalinguistics

ABSTRACT

The development of children's metalinguistic understanding of the basic unit of reading--the word--was examined. Subjects were 45 children from preschool, kindergarten, and first grade who were reclassified according to reading ability (nonreadiness, readiness, reader). The children's understanding of the word as a linguistic segment was measured by their ability to segment aural and visual sentences into words, while their understanding of reading terminology was measured by their performance in recognizing and explaining the terms "letter," "word," and "sentence." ANOVA tests for the children's proficiency on segmentation tasks showed significant differences across grade level and reading ability. Analyses of segmentation errors suggested the use of length and configuration cues on the visual tasks, altered intonation patterns on aural tasks, and the influence of sentence length in both contexts. Significantly more readers/first grade students recognized examples of a sentence than subjects in the other reading ability/grade levels. It was concluded that young children's metalinguistic understanding does exhibit developmental trends. (Author/RL)

**********
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
**********

ED184106

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Technical Report No. 531

# THE DEVELOPMENT OF YOUNG CHILDREN'S METALINGUISTIC UNDERSTANDING OF "LETTER," "WORD," AND "SENTENCE"

by

Karen Kuelthau Allan

Report from the Project on
Studies in Language: Reading and Communication

Wayne Otto
Faculty Associate

Wisconsin Research and Development Center
for Individualized Schooling
The University of Wisconsin
Madison, Wisconsin

December 1979

CS0035SP

APR 17 1980

Copyright 1979 by Karen Kuelthau Allan

This Technical Report is a doctoral dissertation reporting research supported by the Wisconsin Research and Development Center for Individualized Schooling. Since it has been approved by a University Examining Committee, it has not been reviewed by the Center. It is published by the Center as a record of some of the Center's activities and as a service to the student. The bound original is in the University of Wisconsin Memorial Library.

The project presented or reported herein was performed pursuant to a grant from the National Institute of Education, Department of Health, Education, and Welfare. However, the opinions expressed herein do not necessarily reflect the position or policy of the National Institute of Education, and no official endorsement by the National Institute of Education should be inferred.

Center Grant No. OB-NIE-G-80-0117

# MISSION STATEMENT

The mission of the Wisconsin Research and Development Center is to improve the quality of education by addressing the full range of issues and problems related to individualized schooling. Teaching, learning, and the problems of individualization are given concurrent attention in the Center's efforts to discover processes and develop strategies and materials for use in the schools. The Center pursues its mission by

- conducting and synthesizing research to clarify the processes of school-age children's learning and development
- conducting and synthesizing research to clarify effective approaches to teaching students basic skills and concepts
- developing and demonstrating improved instructional strategies, processes, and materials for students, teachers, and school administrators
- providing assistance to educators which helps transfer the outcomes of research and development to improved practice in local schools and teacher education institutions

The Wisconsin Research and Development Center is supported with funds from the National Institute of Education and the University of Wisconsin.

WISCONSIN RESEARCH AND DEVELOPMENT
CENTER FOR INDIVIDUALIZED SCHOOLING

ACKNOWLEDGEMENTS

I wish to thank my major professor, Wayne Otto, for his guidance throughout my doctoral program. I also wish to thank Professors Thomas Barrett, Dale Johnson and Richard Smith for their assistance. And I thank my parents and my husband for their support.



00 6

TABLE OF CONTENTS

ACKNOWLEDGEMENTS..... v

LIST OF TABLES..... ix

LIST OF FIGURES..... xv

CHAPTER ONE

RATIONALE AND REVIEW OF THE LITERATURE..... 1

CHAPTER TWO

METHOD..... 48

CHAPTER THREE

RESULTS AND DISCUSSION..... 67

CHAPTER FOUR

SUMMARY, LIMITATIONS, CONCLUSIONS, AND IMPLICATIONS..... 204

REFERENCES..... 250

APPENDICES..... 254



00 7

LIST OF TABLES


Table 2.1 The Number of Children in Each Reading Ability Classification

Table 3.1 Mean Performance Scores on the Segmentation Task by Children in Different Grade Levels

Table 3.2 Analysis of Variance Summary Table for Grade Level Groups on the Segmentation Task

Table 3.3 Mean Performance Scores on the Segmentation Task by Children with Different Reading Abilities

Table 3.4 Analysis of Variance Summary Table for Reading Ability Groups on the Segmentation Task

Table 3.5 The Number of Children in Different Grade Levels who Performed Correctly on the Segmentation Tasks

Table 3.6 The Number of Children with Different Reading Abilities who Performed Correctly on the Segmentation Tasks

Table 3.7 The Number of Children in Different Grade Levels who Achieved Mastery on the Segmentation Tasks

Table 3.8 The Number of Children with Different Reading Abilities who Achieved Mastery on the Segmentation Tasks

Table 3.9 The Errors on the Visual Context Task by Children in Different Grade Levels

Table 3.10 The Number of Letters Contained Within a Circle Exhibiting a Combination or Division Error

Table 3.11 The Stress Errors on the Aural Context Task

Table 3.12 The Major Constituent Errors on the Aural Context Task

Table 3.13 The Functor Inclusion Errors on the Aural Context Task

Table 3.14 Total Number of Visual Context Errors on Five Sentence Types

Table 3.15 Total Number of Aural Context Errors on Five Sentence Types

Table 3.16 The Incidence of Aural Context Errors on Different Sentence Lengths

Table 3.17 The Incidence of Visual Context Errors on Different Sentence Lengths

Table 3.18 The Incidence of Aural Context Errors on Different Types of Sentence of Equal Length

Table 3.19 The Incidence of Visual Context Errors on Different Types of Sentences of Equal Length

Table 3.20 The Position of Aural Context Errors in the Sentences

Table 3.21 The Position of Visual Context Errors in the Sentences

Table 3.22 The Answers to the Question "What is a Letter?" Given by Children in Different Grade Levels

Table 3.23 The Answers to the Question "What is a Letter?" Given by Children with Different Reading Abilities

Table 3.24 The Answers to the Question "What do we use letters for?" Given by Children with Different Grade Levels

Table 3.25 The Answers to the Question "What do we use letters for?" Given by Children with Different Reading Abilities

Table 3.26 The Ability of Children in Different Grade Levels to Explain the Term Letter

Table 3.27 The Ability of Children with Different Reading Abilities to Explain the Term Letter

Table 3.28 Examples of the Term Letter Given by Children in Different Grade Levels

Table 3.29 Examples of the Term Letter Given by Children with Different Reading Abilities

Table 3.30 The Answers to the Question "What is a word?" Given by Children in Different Grade Levels

Table 3.31 The Answers to the Question "What is a word?" Given by Children with Different Reading Abilities

Table 3.32 The Answers to the Question "What do we use words for?" Given by Children with Different Reading Abilities

Table 3.33 The Answers to the Question "What do we use words for?" Given by Children with Different Reading Abilities

Table 3.34 The Ability of Children in Different Grade Levels to Explain the Term Word

Table 3.35 The Ability of Children with Different Reading Abilities to Explain the Term Word

Table 3.36 Examples of the Term Word Given by Children in Different Grade Levels

Table 3.37 Examples of the Term Word Given by Children with Different Reading Abilities

Table 3.38 The Answers to the Question "What is a sentence?" Given by Children in Different Grade Levels

Table 3.39 The Answers to the Question "What is a sentence?" Given by Children with Different Reading Abilities

Table 3.40 The Answers to the Question "What do we use sentences for?" Given by Children in Different Grade Levels

Table 3.41 The Ability of Children in Different Grade Levels to Explain the Term Sentence

Table 3.42 The Ability of Children with Different Reading Abilities to Explain the Term Sentence

Table 3.43 Examples of the Term Sentence Given by Children in Different Grade Levels

Table 3.44 Examples of the Term Sentence Given by Children with Different Reading Abilities

Table 3.45 Summary Table of the Items Selected by the Total Sample for each Item Requested

Table 3.46 The Items Selected by Children in Different Grade Levels for the Requested Item of Letter

Table 3.47 The Items Selected by Children with Different Reading Abilities for the Requested Item of Letter

Table 3.48 The Items Selected by Children in Different Grade Levels for the Requested Item of Word

Table 3.49 The Items Selected by Children with Different Reading Abilities for the Requested Item of Word

Table 3.50 The Items Selected by Children in Different Grade Levels for the Requested Item of Sentence

Table 3.51 The Items Selected by Children with Different Reading Abilities for the Requested Item of Sentence

Table 3.52 A Comparison of the Correct Performances by Children in Different Grade Levels on Reading Terminology Tasks for the Term Letter

Table 3.53 A Comparison of the Correct Performances by Children with Different Reading Abilities on the Reading Terminology Tasks for the Term Letter

Table 3.54 A Comparison of the Correct Performances by Children in Different Grade Levels on the Reading Terminology Tasks for the Term Word

Table 3.55 A Comparison of the Correct Performances by Children with Different Reading Abilities on the Reading Terminology Tasks for the Term Word

Table 3.56 A Comparison of the Correct Performances by Children in Different Grade Levels on the Reading Terminology Tasks for the Term Sentence

Table 3.57 A Comparison of the Correct Performances by Children with Different Reading Abilities on the Reading Terminology Tasks for the Term Sentence

Table 3.58 A Comparison of the Correct Performances by Children in Different Grade Levels on the Segmentation Tasks and the Terminology Tasks

Table 3.59 A Comparison of the Correct Performances by Children with Different Reading Abilities on the Segmentation Tasks and the Terminology Tasks

LIST OF FIGURES

Fig. 3.1 Aural Context and Visual Context Performance Scores by Children in Different Grade Levels

Fig. 3.2 Aural Context and Visual Context Performance Scores by Children with Different Reading Abilities

## ABSTRACT

The purpose of this study was to examine the development of children's metalinguistic understanding of the basic unit in reading--the word. Metalinguistic understanding was defined in terms of two components of cognitive clarity: (1) the understanding of linguistic segments and (2) the comprehension of reading terminology.

The children's understanding of the word as a linguistic segment was measured by their ability to segment aural sentences and visual sentences into words. The repeated measures segmentation task consisted of eleven test sentences which varied in sentence type and length. The sentences were composed of familiar words which varied in the number of syllables and in their visual configurations.

The children's understanding of reading terminology was measured by their proficiency on an explanation task and a recognition task involving the terms letter, word, and sentence.

Fifteen children in each grade level (pre-school, kindergarten, first grade) were randomly selected from the schools in a small rural-suburban town in central Wisconsin. The total sample of 45 children were reclassified according to the reading abilities of non-readiness, readiness, or reader.

When the children's increasing proficiency on the segmentation tasks was tested by ANOVA, significant differences at the .01 level

occurred among each grade level and among each reading ability. The differences between performances with the aural context and the visual context were not significant. An interaction effect between reading ability and context was significant at the .05 level. Using Scheffe's method, the non-readiness children's performances were found to be significantly different (at the .05 level) from the reader's performances with the two contexts. An analysis of the segmentation errors indicated: (1) length and configuration cues may have been used on the visual task; (2) children altered their intonation patterns on the aural task; (3) sentence length seemed to have influenced the performances with both contexts.

When performances on the recognition task involving the reading terms were tested by chi square analysis, significantly more first graders and readers recognized an example of a sentence than the other grade levels or reading abilities. No significant differences among the grade levels or reading abilities occurred when performances with the terms letter, and word were tested, since a majority of the children performed correctly. Although proportionately fewer children correctly completed the explanation task, the results paralleled the recognition task results.

It was concluded that developmental trends in children's metalinguistic awareness of the word can be described.

# CHAPTER ONE

## RATIONALE AND REVIEW OF THE LITERATURE

The basic unit in reading is the word. Beginning reading lessons focus on the decoding process which utilizes the unit of word. Teachers utilize the term word in their reading and language arts lessons and continually refer to words in isolated and contextual situations. Teachers assume that the word is a stable, concrete, definable concept. Yet, linguists, as the scholars of language, are unable to formulate a rigorous set of criteria for defining words, though, as native speakers, they are able to identify an utterance as a word or a non-word. Furthermore, children, as users of functional language, know only that they communicate and do not know that they use an entity called language. The idea of metalinguistics -- the ability to think about the entity language and to comment on language (Dale, 1976, p. 127) is learned slowly by young children. When reading lessons begin, metalinguistic understanding is necessary because teachers assume that children can analyze language. What metalinguistic understanding do children possess as they approach beginning reading lessons?

This investigation focuses on the development of metalinguistic understanding. Chapter One presents a rationale for investigating children's metalinguistic understanding, a review of related literature, a statement of the problem, and a statement of the focus of the study.

## Rationale

Even though native speakers can identify most instances of a word, the word as a linguistic unit has tenuous status among linguists. Gleason (1955) stated that the English word consisted of a root, a stress morpheme, and optionally derivational and inflectional affixes. But Gleason cautioned that the above statement was not a definition.

> The word is one of the most difficult concepts in English morphology to define, though in the vast majority of cases little question can arise as to whether a given sequence of morphemes is or is not a word. (Gleason, 1955, p. 110)

The difficulty of stating a rigorous definition was reflected in the definitions and criteria proposed by the structural linguists. Bloomfield (1933) defined a word as a minimum free form.

> A word is thus a form which may be uttered alone (with meaning) but cannot be analyzed into parts that may (all of them) be uttered alone (with meaning). (Bloomfield, in Saporta, 1961, p. 28)

Synthesizing the criteria proposed by linguists, Kramsky (1969) stated the following universal definition which can be refined by language specific additions:

> The word is the smallest independent unit of language referring to a certain extra-linguistic reality or to relations of such realities and characterized by certain formal features (acoustic, morphemic) either actually (as an independent component of the context) or potentially (as a unit of the lexical plan). (Kramsky, 1969, p. 67)

Within the above definitions, criteria for identifying words were mentioned but the criteria did not yield identical results (Hockett, 1958). Bloomfield (1933) stated that none of the criteria could be applied rigidly.

The criterion of isolatedness in speech was mentioned in both definitions. Bloomfield (1933) operationally defined the criterion as an utterance which could be meaningfully spoken alone, as in an answer to a question. But grammatical function words, as 'the,' are rarely heard in isolation except in a metalinguistic conversation (Bloomfield, 1933). Thus, Hockett (1958) refined the criterion as potential pauses which a native speaker would insert if requested to speak carefully and slowly.

Related to the first criterion is the criterion of indivisibility which was reflected in the use of "minimum" in Bloomfield's definition. Kramsky (1969) expressed the criterion as cohesion or the impossibility of inserting

another element. He stated that English is an inwardly compact language allowing for only affix additions but other languages are less compact.

Compound words violate the indivisibility criterion because they have divisible segments, which may be heard in isolation (Hockett, 1958). The dilemma can be remedied by adding a third criterion -- stress pattern. A compound word generally reflects the stress pattern of the single word and not the stress pattern of two words in a phrase (Bloomfield, 1933).

A fourth criterion is the function of the word in the sentence or the occurrence of the word in parallel sentences (Bloomfield, 1933). The phrase-word 'devil-may-care' has the stress pattern of a phrase but functions as an adjective in the sentence 'He has a devil-may-care attitude.' and so constitutes a word. Hockett (1958) agreed that a word can function as a grammatical unit or lexeme -- any morpheme which occurs always and only as a grammatical unit in any context. But some lexemes are smaller than words -- red-haired was classified by Hockett (1958) as two words, one minimum form, and three lexemes.

The criterion of meaning was stated in both definitions and Kramsky (1969) specifically included grammatical meaning in his definition. Hockett (1958) stated that the lay person expects that a word has a constant meaning which is predictable from its structure. A minimum free form

does not have a meaning which is predictable from its structure unless it is a word as "chewed" which has the predictable meaning of "chew + past". Hockett (1958) introduced the term idiom for any grammatical form that has a meaning unpredictable from its structure. Thus, every morpheme is an idiom, if it is not a member of a larger idiom. The word "new" is an idiom in "a new hat" but is not an idiom in "The New York Times" which is a larger idiom. The result is that the set of idioms and the set of words overlap only at some points.

A sixth criterion is the word as a phonetic unit. Bloomfield (1933) stated that a language permits a limited sequence of phonemes in the initial, medial, and final positions of words. The permissible sequences of phonemes are violated in some compound words which contain medial sequences not found in single words. "Stove-top" contains the sequence /vt/ which is not found in single words. Kramsky (1969) also mentioned the phonetic criterion but stated that distortions and reductions of phonemes can be permitted, especially in content material, and still the word is recognized. Since the degree of permissible distortion is relative for each individual and each situation, the phonetic criterion has limited applicability.

The difficulties encountered by the structural linguists in seeking to write a rigorous definition of the concept of word can be understood if the concept of word

is viewed as a disjunctive concept. Postive and negative instances of a word can be recognized but a definite set of criteria which can be applied to every case cannot be identified. Indivisibility can be applied to words in general but cannot be applied to the specific set of compound words. The criterion of stress can be added to include compound words in the concept of word. But some multiple compound words violate the stress criterion, and need the addition of the grammatical function criterion. Thus, different criteria are applied for each specific set of instances of a word.

Although linguists have wrangled with the problem of defining a disjunctive concept, teachers proceed as if the concept were easily definable. As native speakers, they can recognize each instance and non-instance of a word. In the course of teaching reading, teachers identify and label positive instances of the word. They expect children to know whether an utterance is a word or not and often query them. In the reading-language arts lessons, the criteria of a word are incorporated. The phonics lessons utilize the phonetic unit criterion; the vocabulary activities the semantic criterion; the language arts lessons the grammatical criterion; and the oral reading activities the stress criterion. In teaching beginning reading, the basic unit is the word. Since a primary goal of beginning reading is mastery of the decoding process, the word is a

relevant unit in word analysis lessons. As reading lessons increasingly emphasize comprehension goals, the word is a relevant unit in vocabulary lessons. Thus, because teachers are native speakers and because the word is a basic unit in the curriculum, the word unit functions as a concrete, stable concept in the instruction of reading.

In the child's functional experiences with oral language, she unconsciously uses the criteria presented by the linguists. In the first place, the child hears a word unit in different contexts and alone, accumulating experiences with the criterion of isolatedness. Having heard words alone and compounded, the child's speech probably contains "day" as one unit and "birthday" as another unit (the indivisibility criterion problem). Secondly, the intonation pattern of her own oral language reflects the unconscious application of the criterion of stress. Third, since a child's sentences are consistent with the rules of her grammar, the child unconsciously uses the criterion of grammatical function. The grammatical function criterion is consciously used by a few children since Gleitman ; Gleitman and Shipley (1972) found that children could recognize silly sentences and even explain the ungrammaticalness of the silly sentences. Fourth, through the functional use of language in daily living, the child unconsciously applies the meaning criterion. In naming games the child experiences a word and an object but the name is

synonymous with the object and not a separate entity itself. Gleitman, Gleitman, and Shipley (1972) found that children easily recognized a semantic anomally. The children consciously used the meaning criterion before they consciously used the grammatical criterion. Fifth, the child experiences the phonetic unit criterion through rhyming language play in which "nonsense words" (negative instances) are as acceptable as "real words" (positive instances). Thus, the child's spontaneous, functional experiences with language incorporates the various criteria for a word which were suggested by linguists.

The child, however, remains generally unaware that his language contains elements which could be consciously analyzed. In the child's functional, spontaneous experiences with language, the need to view language as a separate entity rarely arises. Metalinguistic ability, or the ability to think about language, is not required to orally communicate one's ideas, wants, or desires.

Upon entrance into school, a major portion of the child's day includes analyses of language. The task of learning to read involves the analysis of language in its printed or visual form in relation to its spoken or aural form. With the onset of reading lessons, the child must bring his unconscious experience with language to bear consciously so that the task of learning to read can be solved. As Rozin and Gleitman stated:

> We believe there is a cognitive problem as well: although children 'know' the structure and content of their language in the weak sense of being able to use it effectively, they cannot necessarily access this knowledge toward the solution of further problems, such as reading. We believe that conscious awareness of, and access to, implicitly known language facts and processes are necessary for learning to read. (Rozin and Gleitman, 1977, p. 90)

The child must consciously recognize the elements of language. In particular, he must recognize the basic unit in reading -- the word. The conscious recognition of the word needs to be accomplished both within the teacher's oral language which he hears and his own oral language which he speaks (aural context) and within the printed language which he sees (visual context). Vernon described the aural and visual task presented to the child learning to read:

> But though they may comprehend the meaning of whole sentences, they may find it more difficult to break these up into words, since they are accustomed to hear and understand complete phrases in speech rather than separate words. (Vernon, 1971, p. 44)

> In learning to read the child must realize that the sequences of printed shapes represent the linguistic patterns which he hears and utters. Moreover, the linguistic patterns are not simply continuous structures of phonemes, but must be broken up into discrete units -- the words -- corresponding to the visual structures separated by empty spaces. To do this,

> he must understand that the teacher's continuous speech pattern is made up of separate words, some of which, in whole word teaching methods, can be used singly as names attached to objects and pictures of objects. (Vernon, 1971, p. 45)
>
> . . . the child is obliged to organize his visual and auditory perception and to reason about the relationship between the printed symbols of the text and the verbal symbols of language which indicate its meaning. (Vernon, 1971, p. 77)

Vernon's (1971) statements on the initial reading task can be corroborated by Clay's (1969) observations of the reading errors and self-correction behaviors of children learning to read. The reading readiness state was characterized by attempts to find the print which matched what was being said. At first, the child matched the page to the memorized text she was saying. Then the child sought to match the line to the memorized line she was saying. Thirdly, she located some of the words within the memorized line. Finally, the child learned to coordinate the visually located word pattern with the spoken words, and to coordinate the spaces with voice juncture. Clay (1969) concluded that the coordinating behavior resulted in two types of possible mismatches:

1. There were too many or too few spoken words for the number of patterns available in the left to right movements across the page (movement -- speech mismatch).

2. The spoken word did not coincide with the word's visual pattern as the child read word by word (speech -- vision mismatch).

As the child learned to read, the mismatches between the aural context and the visual context were eliminated. The child learned to segment and identify the basic unit in reading -- the word -- in both the aural context and the visual context. Thus, the cognitive problem of consciously recognizing the units of language in the aural and visual contexts is one metalinguistic analysis which is involved in learning to read. According to Downing (1971a) the cognitive problem of consciously recognizing linguistic segments or units is one aspect within the broader concept of cognitive clarity.

Cognitive clarity is a term used by Downing (1971a) to describe the child's understanding of the reading task. Initially, the child is in a state of cognitive confusion -- having no understanding of what is involved in the task of reading. As the child learns to read, the child attempts solutions which approximate more and more closely each aspect of the reading process (Downing, 1971b). Cognitive clarity is demonstrated by increased understanding in five areas: the communicative purpose of language, the function of symbols, the concept of linguistic segments, the abstract technical terms, and the process of decoding (Downing, 1971a). These five components of cognitive clarity are metalinguistic tasks. A child must be able to consciously

analyze language and the reading task to demonstrate understanding in the five components.

The concept of linguistic segments component is similar to Vernon's statements (1971) and Clay's observations (1969). As a major task of beginning reading, the child must consciously analyze language to recognize and identify the linguistic segment word which is a basic unit in beginning reading. Although she has previously only used language unconsciously, she must now consciously recognize the word as an object embedded in her teacher's and her own oral language (aural context) and as an object embedded in print (visual context).

A second component of cognitive clarity which involves the metalinguistic understanding of word is the understanding of abstract terminology component. The child must consciously analyze language to recognize and identify the referents for the technical term word, when the term is used by the teacher. Although linguists cannot define the term word, the child must formulate an operational definition to understand the teacher's terminology in beginning reading instruction.

Thus, cognitive clarity is a unifying concept which can be used to describe the metalinguistic task before the beginning reader. Two components of cognitive clarity -- the concept of linguistic segments and the understanding of abstract technical terminology -- can be used to des-

cribe children's metalinguistic understanding of the basic unit in reading -- the word. Consequently, the focal points of this investigation are the concept of linguistic segments and the understanding of abstract technical terminology components of cognitive clarity. Literature related to these two components will be presented in the next section.

## Review of the Literature

This investigation of children's metalinguistic understanding is based upon two components of cognitive clarity -- the concept of linguistic segments and the understanding of reading terminology (Downing, 1971a). In the present section, literature pertaining to each component is reported, and conclusions drawn.

### Concept of Linguistic Segments

The concept of linguistic segments becomes relevant when reading becomes a contextual task. If reading were a labeling procedure involving isolated words, then word boundaries would be unimportant. When the child encounters more than one word to read, then the child needs to understand the boundaries of words. Since reading involves matching what the child is saying to the page, line, and patterns of the strings of words (Clay, 1969), the child must learn the linguistic segment word in the aural context

(oral language) and the visual context (print). In accordance, researchers have investigated children's concept of the linguistic segment word in the visual context, the aural context, and the paired aural-visual contexts.

Visual context research. Meltzer and Herse's (1969) study concerning children's identification of the word in print is the major investigation in the visual context research. The 39 beginning first graders were given a printed sentence and asked first, to count and point to each word and, secondly, to either circle each word or to cut apart each word. The children exhibited several types of errors which seemed to coincide with the types of words used in their basal reading program. The errors were categorized by Meltzer and Herse into the following five types:

1. Letters and words are synonomous.
2. Combined letters are words but there is no regard for space.
3. The number of letters is the dominant cue.
4. Short words are honored but long words are split.
5. Space is a boundary cue but tall letters are a cue also.

Although most of the children's errors fit into the hierarchial progression of stages, proceeding from category one to category five, some of the children's error patterns did not. Most children committed more than one type of error so that the error types could not be defined as descrete stages.

Examining the errors or the developmental stages of the Meltzer and Herse (1969) study, Kingston, Weaver, and Figa (1972) used three types of texts in their experiment: basal reader text, second order approximation of English text, and adult novel text. The basal reader text and the second order approximation text showed similar results and both were significantly easier to segment than the adult novel text. The first graders' most common error was the combination of two words. The frequency of errors was especially high with the adult novel text. Although the first graders exhibited all the errors listed by Meltzer and Herse (1969), Kingston, Weaver, and Figa (1972) did not find a progression of errors which could be classified as stages in a developmental trend.

The only other study involving performances with visual word boundaries was done by Michish (1974). She presented a six-word, unspaced sentence for the children to segment and also played an auditory tape of the sentence. Michish found that no student on the readiness level could segment the sentence correctly, while 81% of the students on the first reader level could correctly segment the sentence. The performance difference between readiness children and readers may have resulted from the unspaced sentence format used. An unspaced sentence might have required reading ability to formulate word boundaries as opposed to a spaced sentence where the boundaries are given. Michish did not report an investigation into the types of errors committed

by the children.

The Michish (1974) study was poorly conducted. The performances with the visual context were confounded by the continual playing of the auditory tape during the reportedly solely visual task. The study was poorly reported since the number of subjects per reading level, and the basal reader test used to establish the reading levels were not given.

The performances of a few poor readers have been studied as an adjunct to the primary study. Meltzer and Herse (1969) found that of the thirteen poorest readers in a second grade, six children honored short words but split long words (stage 4). Michish (1974) found that poor first grade readers could not segment the sentence correctly even though they "had been taught the words".

In summary, the results of the studies on the visual word boundaries identified types of errors made by children as they learned to identify the word units. A hierarchial progression of errors in word boundaries was hypothesized but not confirmed. The types of errors may have been influenced by the common instructional method -- a basal reading program.

Aural context research. In contrast to the visual context research which amounts to one major study, the aural context has been investigated in several studies. Interest in the child's oral language development has lead linguists to examine the child's ability to view oral language as an

object which may be partitioned. The conclusion reached in Karpova's study reoccurred throughout the research -- development proceeded from the semantic, wholistic view of language to the metalinguistic, objective awareness of language.

Karpova (1955) studied children from three to seven years old as they repeated sentences, told how many words were in the sentence, and told which word was first, second, etc. Karpova found that the Russian children exhibited stages of development:

1. For the youngest children, the sentences were generally unified wholes, though there could be some semantic separation.

2. Wholistic semantic interpretations dominated the children's first response but, on questioning, there was some isolation of the main action -- nouns were isolated first; then subject and predicate isolation.

3. For a few of the older children, separate words were isolated but the preposition and conjunction word classes were not.

Karpova trained the children to move a counter for each word stated. If the child could segment with difficulty on the verbal task before training, then the child segmented better after training. No transfer effect was found if the child was unable to segment sentences before training. Therefore, the training did not teach the child to segment but aided the child if he could segment a sentence.

The verbal response, as opposed to the combined verbal-

motoric response, was examined when Huttenlocher (1964) orally presented pairs of items representing various semantic relationships to four and five year olds:

1. letters and numbers
2. same part of speech words
3. common word pairs which become ungrammatical when reversed
4. common word pairs which remain grammatical when reversed
5. anomolous pairs

One group of children (n=33) verbally reversed the pairs and a second group (n=33) repeated the pairs, segmenting the pairs with a pause and a tap. Three in group one and four in group two responded correctly to all items. The common pairs were the most difficult for both groups, indicating the dominance of semantics. The children who had difficulty doing the tasks were given the other group's task. Only one child, from a group of 10 children who had difficulty separating the items (group two), could reverse the items verbally. Two children, from a group of 13 children who had difficulty reversing the items (group one), could separate the items. Huttenlocher concluded that the separation of items was the primary ability needed to perform the solely verbal task.

Kingston, Weaver, and Figa (1972) used compound words and word pairs in their fourth reported experiment. The child indicated whether he heard one or two words. The

fifteen first graders had difficulty differentiating a compound word from two words, as could be predicted from Huttenlocher's (1964) segmentation study.

Holden (1972) examined the development of word awareness using three experimental tests in which the pairs of items differed by one word. In each test the child was to identify the additional word, but the semantic conditions varied.

> Test I - Lists: The additional word increased the length of the paired lists of two to five words by one -- "flower, tree," "flower, tree, bush".
>
> Test II - Sentences: The additional word did not substantially change the meaning of the sentence pairs -- "The dog is funny." "The brown dog is funny."
>
> Test III - Homophones: The additional word caused a change in the meaning of the second sentence of the item -- "The boy went by it." "The boy went to buy it."

The results showed that first graders were better than kindergarteners on all items. The list word awareness test with little semantic content was the easiest; the sentence test more difficult; and the homophones test with two different semantic contents the most difficult. In factor analysis, the word awareness tests loaded on the same variable as chronological age. Thus, in accordance with the previous studies, Holden found that semantic content increased the difficulty of the task and that older children were more successful than the younger children.

In a study on the word consciousness of readers and

pre-readers, Ehri (1975) presented four tasks:

1. Sentence generation -- The child told a sentence using the word given by the E.

2. Sentence segmentation -- The child tapped with a stick or laid down chips for each word and for each syllable of an oral sentence, yielding a total of four conditions.

3. Sentence comparison -- The child identified the word which was different in the sentence pairs. Words were relocated, added, substituted, or omitted.

4. Syllable-in-a-word selection -- The child was presented with a syllable sound, followed by the sentence using the sound in a word. The child identified the word containing the sound. The syllables were at the beginning of the words, receiving primary stress, or at the end of the words, receiving no stress.

If the child was not successful on a task, the experimenter modeled the correct performance and the child tried again.

In general, the readers (seven first graders, and one kindergartener) performed better than the pre-readers (eight kindergarteners and eight pre-schoolers). On the sentence generation task, pre-readers of kindergarten and pre-school did not differ in their performances. Both groups generated primarily phrases instead of sentences. Thus, both pre-reader groups formulated significantly fewer sentences than the readers.

On the sentence segmentation tasks, the readers were more successful than the pre-readers. Significantly more pre-readers than readers failed to mark the words in a sentence. The pre-readers often omitted function words, but their marking and non-marking of functors was not consistent.

Readers were less likely to omit words on the syllable task. Pre-schoolers significantly more than kindergarteners and readers erred by giving multiple marks to words which were two morphemes and to words which received stress on the second syllable. The pre-schoolers also had the most difficulty shifting from the word to the syllable task which may have confounded the multiple marking results.

On task three, sentence comparison, the readers identified the word which distinguished the two sentences more often than the pre-readers. An examination of the errors revealed that semantic factors may have governed the ability of the children to detect word changes. The younger children identified noun phrases or repeated entire sentences (Karpova's stage one). They were unable to remove a stressed word from its context. For relocated words, the younger children described the new meaning and did not tell which word was moved. If asked to tell one word, the children sometimes supplied the word affected by the change rather than the word creating the change.

On the syllable-in-word task, all children performed well with first syllable stress words. However, readers identified more final syllable stress words than pre-readers did.

In summary, the aural segmentation studies of Karpova (1955), Huttenlocher (1964), Holden (1972), and Ehri (1975) indicated that performances were influenced by the semantic

content of the utterance. Older children exhibited more ability to treat words as entities which could be extracted from their semantic content. Both Holden (1972) and Ehri (1975) found that readers could extract words from their semantic content while pre-readers had difficulty. Yet Holden (1972) found a low correlation between her aural experimental tests, a reading readiness test, and a reading achievement test which may be an expression of the different tasks included in the three different tests.

Paired aural-visual context research. The researchers investigating the visual context described words and performance patterns topographically, while the researchers investigating the aural context described words and performance patterns semantically. Each description was valid for the respective context. Because reading involves both contexts, the words composing the tasks of the two contexts should be comparable, although descriptions may vary with the respective contexts. Unfortunately, comparable tasks were not included in all of the studies which involved both an aural context and a visual context.

Holden and MacGinitie (1972) tested kindergarten children aurally using the Karpovan training task of repeating the utterance and then tapping a poker chip for each word as the sentence was repeated again. The sentences used were different types, but they were continually revised and the rationale for the revisions was not given. The results

of the aural tasks showed that words were frequently combined across phrase boundaries. Function words were harder to isolate than lexical words and were more often compounded with the following words.

The visual task used a concurrently developed "Test of Understanding of the Printing Convention" which presented the auditory sentence in four different typographies -- one of which used conventional spacing. Responses were scored as congruent if the number of letter clusters equalled the number of taps; as conventional if the number of letter clusters equalled the number of words; or as both congruent and conventional. The results were that five kindergarteners segmented conventionally and congruently. No kindergartener segmented conventionally if she did not also segment correctly in the auditory mode. Twelve children segmented congruently in their own idiosyncratic manner. Twenty-five children did not respond consistently and fifteen were unscorable since they tapped so often that there was no corresponding visual representation.

Kingston, Weaver, and Figa (1972) in their second reported experiment presented three conditions to first grade children: aural (the experimenter read the words), visual, and taped. The child responded by putting a cube on the table for each word in the two to six word phrase or sentence. In the visual or "reading" condition the number of words was overestimated, while in the aural and

taped conditions the number of words was underestimated.

Studying first graders in mid-year, Figa (1972) also used the aural segmentation task of Karpova (1955) with materials from a basal reading program. The aural task was used to identify high and low ability groups for the four conditions of the visual task. The visual task was the Meltzer and Herse (1969) task of cutting apart each word under four conditions:

1. spaced and punctuated sentences
2. spaced and not punctuated sentences
3. not spaced and punctuated sentences
4. not spaced and not punctuated sentences

The aural test results were that as length increased from four to ten words, errors increased. On the visual task, aural segmentation ability and spacing were significant. Punctuation and any interactions were not significant. No consistent relationship between the performances on the aural and the visual segmentation tasks was found. Among the children who scored high on the aural task, some children did not score high on the visual task, while others did score high on the visual task.

McNinch (1974) compared a Karpovan (1955) task and a Meltzer and Herse (1969) task with reading readiness test results and reading achievement at the end of first grade. The first grade reading program was not begun until after McNinch had presented his tasks but McNinch did not assess whether the children could read prior to first grade. The aural task contained two word utterances through six word

sentences with different intonational and junctural patterns. No differences among high, average, and low readiness groups were found on the aural task. Although the aural scores were not associated with reading readiness test scores, they did predict reading achievement at the end of the first grade.

The visual task consisted of only one of the sentences used by Meltzer and Herse (1969). Since only the low group equated letter and word on the visual task, McNinch stated that the task distinguished among the readiness groups. The visual task scores did not predict end of the year achievement.

The conclusions drawn by McNinch were that the perception of aural boundaries was a significant predictor of reading achievement and merited consideration as a prerequisite to learning to read.

Summary of the linguistic segment research. The studies which paired the aural and visual contexts did not agree on the relationship of the performances with the aural and visual contexts. Holden and MacGinitie (1972) found that aural segmenting ability was necessary for correct visual segmentation. Presenting the aural first, Figa (1972) found no consistent relationship between the two -- a high aural score could be paired with either a high or a low score on the visual task. McNinch (1974) found that the visual context task discriminated among readiness groups while the

aural context task predicted end of the year achievement. Thus, no conclusions can be drawn about the relationship of performances with the paired aural-visual segmentation tasks.

A comparison of performances with the two contexts within a study cannot be made because each study contains procedural problems. Except for Figa's (1972) study which did use comparable sentences, different sentence types were used in the aural and the visual contexts. McNinch (1974) used only one sentence in the visual context, but used fifteen utterances in the aural. Holden and McGinitie (1972) continually revised the sentences during the study. Thus, one reason that no conclusion can be drawn about the relationship of the performances with the paired contexts is that incomparable tasks were used within two studies.

Different criteria were used for the selection of the stimuli in the paired context studies. Holden and MacGinitie (1972) used general sentence type; Figa (1972) used basal reader words in increasingly longer utterances; and McNinch (1974) used juncture patterns for the aural but did not report why one sentence from the Meltzer and Herse (1969) study was chosen. The continual revisions in one study and the lack of comparable criteria in another study reduce the possibilities for formulating reasonable generalizations about performances with the two contexts. Consequently, a line of research where stimuli have been consistently varied

is hard to establish.

Although different aged children were studied (Figa, 1972, studied mid-year first graders; McNinch, 1974, studied beginning first graders; and Holden and MacGinitie, 1972, studied kindergarteners), a grade level -- performance relationship can only be hypothesized due to the incomparability of the stimuli. In the visual context research, only first graders were tested so that no hypothesis regarding grade level was stated. In the aural context research, older children and readers were repeatedly more successful. Thus, the conclusions drawn from the aural context research and the hypothesis indicated by the paired context research, suggest that a prediction of better performance by older children could be stated.

The paired aural-visual context research offers little information about the error patterns of the performances, since only Holden and MacGinitie (1972) examined error patterns. In the other studies, performances were analyzed from a pass or fail standpoint. However, conclusions may be drawn from the visual context research and the aural context research. Meltzer and Herse (1969) found topographical error patterns which seemed to be influenced by configuration and length cues. The degree of semantic content was continually found to have influenced the error patterns in the aural context.

In summary, the following conclusions can be deter-

mined from a review of the paired aural-visual context research, the aural context research, and the visual context research. First, the relationship of performances with the two contexts was not confirmed. Procedural problems and inconsistent criteria for the selection of the stimuli were the primary reasons for the unclear line of research. Second, a prediction of better performance by older children and by readers can be drawn from the aural context research and the paired context research. Third, performance errors on the visual context task seemed to have been influenced by configuration and length cues, while performance errors on the aural context task seemed to have been influenced by the semantic context of the utterances.

Understanding of Reading Terminology

In the concepts of linguistic segments research, the children's performances on contextual segmentation tasks were the measures of metalinguistic understanding. Different measures of children's metalinguistic understanding were adopted by researchers concerned with the understanding of reading terminology. These researchers used the children's responses to reading terms as indicators of metalinguistic understanding.

During a reading lesson, a teacher uses the terms word, letter, sentence as he refers to examples in isolation and in context. The child must form his own operational definition about which instances apply to the specific term.

The child's operational definition may include a verbalization of a generalization concerning the examples of the term or the child may only be able to indicate when a correct example is present.

In accordance, researchers have utilized two methods to determine children's understanding of reading terminology. Using interview questions, the researchers have sought to elicit the children's own generalizations about the terms. The children were required to explain the terms without any assistance. For example, when asked what do we use words for, the child stated his original generalization regarding the function of words in language. In contrast to the explanation task, the second method, a recognition task, did not require any original statements or generalizations. Since the researcher stated the term and presented an array of examples of reading terms, the child needed only to point to the correct example to communicate his understanding. Thus, the recognition task required only comprehension of the term, while the explanation task required both comprehension of the term and verbalization ability. These task differences may define whether a child can communicate his understanding of a term. A child may understand the term if given a recognition procedure, but be unable to verbalize a generalization and so not communicate his understanding if given an explanation task. Thus, the conclusions drawn by researchers must allow for the requirements of the tasks.

Since the conclusions drawn from the studies must account for the different requirements involved in the explanation task and the recognition task, the literature review has been organized according to the type of task employed in the research.

Explanation task research. Children's understandings of reading terms were investigated through the explanation task in four studies. Two studies (Reid, 1966 and Downing, 1969-1970, 1971-1972) were conducted in the British Isles where five year old children are taught to read during their first year in school. Interviewing Scottish children, Reid (1966) found a gradual honing of the children's use of technical vocabulary and an increasing understanding of the reading process. In the first interview, the children used the terms number and letter interchangeably when referring to either numbers or letters. Semantic interpretations were given for words -- words were synonomous with names. Books were also described in semantic terms as containing pictures and characters and not described as containing words and sentences -- the reading terms which Reid was seeking. The children's writings were isolated symbols and had no connection with reading.

During the second interview, the synonyms for reading terms did not include numerical terms. Letters, if confused, were confused with words. Sounding was called spelling, copying, or saying. Since a change in the capitalization of

a word or in the movement of a word to the middle of a sentence created a new word for the children, Reid concluded that the children had not distinguished between arbitrary and relevant cues for words.

At the end of the year, the children used the terms of reading to explain their sounding problems and techniques. Most of the children could explain about the spaces between words and speculated on the use of capitalization. The function of meaning in relation to a word was verbalized for the first time. Thus, Reid concluded that the children had developed the concepts expressed in the reading terms of letter, word, and sentence.

Downing (1969-70, 1970, 1971-72) found results similar to Reid's (1966) for the first and second interviews. The English children initially showed little inclination to use reading terms to describe the content of books. Instead, they also preferred the semantic content of books, mentioning only characters and names. The confusion exhibited by incorrect synonyms were reported by Downing also. The children confused the terms number and letter, letter and word, and write and draw.

But contrary to Reid's (1966) results of the third interview, Downing found there were still some children who confused the terms letter, sound, and word in their verbalizations. In identifying words, space did not become an important cue, while length of a word was important. The

function of meaning in a concept of a word was not mentioned. Thus, Downing concluded that cognitive confusion lingered for slower readers.

Landsdown and Davis (1972) described similar confusions of reading terms when older, mentally retarded, children were interviewed.

Using the questions of "Can you tell me (word) -- any (word) you know? What do we use (words) for?", Francis (1973) periodically interviewed English children about their concepts of letter, word, and sentence. Letters were confused with numbers initially but correct examples for letters were given earliest in the year. Words were confused with numbers and names more than with letters or sentences. Words were given correctly in the last testing period. Sentence questions usually produced either no response or a correct response. The production of sentences did increase through the year. Francis concluded that the learning of reading terms progressed in a hierarchial manner -- letter, word, sentence.

The explanation task studies included the requirement of verbalization about the terms (letter, word, sentence) as a criterion for understanding. A child may understand the term when a teacher uses it but still not be able to correctly use the term himself. To determine whether a child could understand the terms or recognize examples of the terms, visual aids have been used in three studies.

Recognition task research. Downing (1969-70, 1970, 1971-72) presented the following visual aids and asked questions about the stimuli:

1. Photographs of teachers and children reading and not reading. "Is he reading?"

2. A book with only text. "What do you do when you read?"

3. Two cars, one which had the letter L on the license plate. (An L is required on the license plate of a learner in England.) "Which car has a learner driving?"

4. Three toy buses with the route number and destination written on them. "How does your mummy know which bus to get on?"

The children responded to the questions about the stimuli by pointing to the pictures of readers and the car with a letter L. However, their accompanying explanations -- how they knew the car had a learning driver or how their mummy knew which bus to get on -- included the confusions exhibited in the interview data. By the end of the year, not all children used the verbal labels correctly or gave clear explanations.

Landsdown and Davis (1972) found similar responses with older, mentally retarded, children.

After the interview, Francis (1973) presented the children with a single card exhibiting two examples of letters, words and sentences in a "well defined space". To prevent the confounding of identifying a word within a sentence example, the child was asked if he meant that the entire item within the boundary lines (sentence) was

his response for the requested item (word). The results indicated that a letter was the easiest to identify but not many first graders recognized one in the first testing period. The examples of words were more difficult to recognize than the examples of letters. In the last testing period, word examples were easily recognized. When errors did occur, word examples were confused with letter examples more often than with sentence examples. Sentence examples were confused with word examples and not understood until the last testing period.

Two researchers presented auditory stimuli instead of visual stimuli. In his first study (Downing, 1969-70, 1970, 1971-72), the directions were unclear and the stimuli were confounded. In his second study (Downing and Oliver, 1973-74) these limitations were rectified to some extent. Auditory training trials were given to insure that the children understood to respond to the single item and not to a string of similar items. Eight categories of auditory stimuli were included -- non-verbal abstract, non-verbal realistic, isolated phoneme, isolated syllable, short word, long word, phrase, sentence. The children were to state whether a stimulus was a word or not a word.

The results showed a significant difference between the grade levels. Pre-schoolers and kindergarteners gave significantly fewer correct responses on long words, phrases, and sentences than first graders. Differences between pre-

schoolers and first graders were significant at .01 and differences between kindergarteners and first graders were significant at .05. Other differences were not significant.

There were significant differences among the categories of stimuli. All children gave significantly fewer correct responses to phonemes and syllables. Pre-schoolers gave significantly fewer correct responses to sentences than to long and short words and non-verbal realistic stimuli, and fewer correct responses to non-verbal abstract stimuli than to short words. Kindergarteners gave significantly fewer correct responses to long words than to short words and non-verbal realistic stimuli. First graders gave significantly fewer correct responses to phonemes and syllables.

The proportion of children demonstrating the concept f a word was analyzed and significant differences were found due to stimulus class and grade level. Pre-schoolers and kindergarteners did not recognize that phonemes and syllables were not words. One first grader recognized that phonemes were not words, while none recognized that syllables were not words. Significantly more first graders than pre-schoolers recognized that non-verbal abstract stimuli, phrases and sentences were not words, while short words were. Significantly more first graders than kindergarteners recognized that long words were words.

In Kingston, Weaver, and Figa's (1972) study, first graders had difficulty differentiating between words and human sounds. When asked to identify the number of words in a sentence which contained both sounds and words, the children were unable to perform the task. They had difficulty remembering the sentences and confused noises and sounds with words.

Thus, in the recognition task research, responses to both visual stimuli and auditory stimuli showed a gradual learning to recognize isolated examples of the terms of reading instruction -- letter, sound, word, sentence.

Summary of the reading terminology research. From the reading terminology research which used an explanation task, the conclusion can be drawn that the child approached the reading task, at the beginning of their first year in school, without the ability to explain the terms used by the teacher. During the year, the children learned to explain the terms, number, letter, sound, word, sentence. Francis (1973) found a hierarchial sequence -- letter, word, sentence -- in the children's ability to explain the terms. Whether the terms can be explained by all children at the end of the first year (Reid, 1966, and Francis, 1973) or by only the better readers (Downing, 1969-70, 1970, 1971-72) remains unclear.

Corresponding conclusions can be drawn from the research which used recognition tasks. Unable to recognize

examples of the terms at the beginning of the year, the children learned to recognize examples of the terms. Similarly, Francis (1973) found a hierarchial progression in the learning -- letter, word, sentence. Again there were different conclusions about mastery at the end of the first year. Francis (1973) found mastery at the end of the first year, while Downing (1969-70, 1970, 1971-72) found only the better readers had mastered the recognition tasks. Downing and Oliver's (1973-74) refinement of the aural recognition task found increasing mastery among pre-schoolers, kindergarteners, and first graders.

Only two studies addressed the difference between the dual requirements of comprehension and verbalization in the explanation task and the single requirement of comprehension in the recognition task. Francis (1973) found no difference in the performance on both tasks. Downing (1969-70, 1970, 1971-72) did not find comparable performances on the explanation task and the recognition task. Thus, agreement on the influence of the respective task requirements cannot be stated.

## Conclusions

An examination of the literature related to the two components of cognitive clarity -- the concept of linguistic segments and the understanding of reading terminology -- does not yield a description of children's development of metalinguistic ability as they approach the reading task.

From the concept of linguistic segments research, an age related or reading ability related conclusion can be consistently supported only by the aural context research. Every aural context researcher reported that older children and readers were more able to isolate the word from its semantic environment (Karpova, 1955; Huttenlocher, 1964; Holden, 1972; and Ehri, 1975). Since the visual context researchers only tested first graders, no age related conclusion was stated. Based on their error analysis, Meltzer and Herse (1969) hypothesized that the errors committed by better readers were different from the errors committed by beginning readers. But no reading ability related conclusion was stated because the error patterns did not form statistically significant stages. In the paired aural-visual context research, children in different grade levels were tested in each study; but due to the incomparability of the stimuli, both within a study and between studies, no conclusion regarding performance and grade level can be drawn.

No conclusion regarding the relationship of performance with the aural context and the visual context can be derived from the concept of linguistic segments research. Each researcher who paired the two contexts arrived at a different conclusion. Holden and MacGinitie (1972) stated that aural segmentation ability was necessary for the visual segmentation task. Figa (1972) found no consistent rela-

tionship between the contexts. McNinch (1974) found that the visual context task discriminated among readiness groups while the aural context task predicted reading achievement.

In addition, procedural problems limit the conclusions which can be drawn concerning the relationship of performances with the contexts. First, only Figa's (1972) study used comparable sentences in the aural and visual contexts. Holden and MacGinitie (1972) continually revised the sentences as the study progressed. McNinch (1974) used only one sentence in the visual context task while he used fifteen utterances in the aural context task. Secondly, different criteria for the composition of the sentences were used in each study. Holden and MacGinitie (1972) used general sentence type; Figa (1972) used basal reader words in increasingly longer sentences; and McNinch (1974) used juncture patterns for the aural context but did not state the reason for the use of one sentence from the Meltzer and Herse (1969) study. Thus, because of the lack of comparable tasks in the two contexts and because conflicting conclusions were drawn by the researchers, no statement concerning the relationship of performances with the aural and the visual contexts can be made.

Conclusions regarding the error patterns in the visual context and in the aural context can be stated. In the visual context research, Meltzer and Herse (1969) found consistent topographical error types characterized by con-

figuration and length cues. These error types were confirmed by Kingston, Weaver, and Figa (1972). However, the error types did not form discrete stages of development. In the aural context research, the degree of semantic content seemed to have influenced the performances. Younger children treated the sentences as an indivisible unit, while the oldest children still did not consistently isolate functor words.

Based on the research concerning children's understanding of reading terminology, age related and reading ability related conclusions cannot be stated. Some children learned to explain and to recognize examples of reading terms during their first year of reading lessons (Reid, 1966; Francis, 1973) and other children did not. Downing (1969-70, 1970, 1971-72) concluded that only the better readers understood the terms.

Only Francis (1973) concluded that the children learned the terms in a hierarchial sequence -- letter, word, sentence. No other researcher sequenced the understanding of the terms.

Two researchers addressed the difference in the task requirements of an explanation task in contrast to a recognition task but the results differ. Francis (1973) found no difference in the performances, while Downing (1969-70, 1970, 1971-72) did not find comparable performances. Thus, no conclusion regarding task requirements and performances

can be made.

Therefore, the primary conclusion drawn from the related literature is that older children and readers are better able to comprehend linguistic segments and reading terminology. More definitive conclusions regarding the metalinguistic development can only be stated when caveats to methodological problems are included.

## Statement of the Problem

Although linguists wrangle with the concept of word and prefer more rigorous terms and concepts for their analyses, educators proceed as if the concept were stable and concrete. Teachers assume that children understand the term word and that children can identify examples of a word in isolated and contextual situations. Children have unconsciously used the variable criteria of a word in their functional language but have minimal experience in the conscious examination of the word. To learn to read, children must learn to examine language from a metalinguistic -- not an experiential -- standpoint.

From the research related to the development of metalinguistic ability, one conclusion can be formulated -- older children and readers comprehend linguistic segments and reading terminology better than younger children and non-readers. No conclusions regarding the development of the comprehension of linguistic segments or reading ter-

minology can be stated.

Thus, the central purpose of this investigation is to examine the development of children's metalinguistic understanding of the basic unit in reading -- the word. Answers to two specific questions are sought: (1) Are there developmental trends in metalinguistic understanding? (2) If there are, how can the developmental trends or differences in task performances be accounted for?

## Focus of the Study

Children's concepts of the linguistic segment word were examined in both the aural context and the visual context. Existing research on the aural context, the visual context, and the paired aural and visual contexts offered no information concerning the relationship of performances with the two contexts. Consequently, the decision for this study was to include similar aural and visual segmentation tasks. The Meltzer and Herse (1969) task of segmenting sentential print (visual context) was considered a close analogue to the Karpova (1955) task of segmenting a stream of speech (aural context). Since pauses are not necessarily heard in a stream of speech, the analogue could have been made closer by excluding the space cue in the visual context -- a significant condition in Figa's (1972) study. Because successful segmentation of an unspaced text probably requires recognition of the word, unspaced text was considered not

to assess a concept of the word, but to assess reading ability. Thus, the resolution for this study was to use space in the visual context and to include only similar aural and visual segmentation tasks to investigate the relationship of performances with the two contexts.

In the previous research, the children's ages or grade levels were not comparable. Children from three through seven years old were studied in the aural context research and the older children exhibited more proficiency on the aural segmentation task. Either kindergarteners or first graders were studied in the paired aural-visual context research but a similar progression in proficiency can only be hypothesized because the tasks were not comparable. Only first graders were studied in the visual context research so that no progression can be stated. Consequently, the decision was to include children of different grade levels (pre-school, kindergarten, and first grade) and to require each child to perform on both the aural context and the visual context segmentation tasks. Increased proficiency in performance on the segmentation tasks as children in higher grade levels were tested was expected.

Due to the incomparability of the segmentation tasks used in the previous research and due to the poor methodology employed in some of the previous research, no prediction was made as to whether the different contexts would have a differential effect on the performances by children

in increasingly higher grade levels.

The existing research on the visual context and on the aural context indicated that the children's reading ability may have influenced their performances on the segmentation tasks. Consequently, the decision was to determine whether the children's reading abilities were reader, readiness, or non-readiness. An increased proficiency in performance on the segmentation tasks as better readers were tested was expected.

For reasons given above, a prediction as to whether the different contexts would have a differential effect on the performances of children with different reading abilities was not made.

Thus, to examine developmental differences in children's metalinguistic understanding of the linguistic segment word, the following specific research hypotheses were formulated.

> Research Hypothesis 1: Pre-schoolers, kindergarteners and first graders will exhibit an increasing proficiency in their ability to segment words as measured by the total number of words divided at their respective potential pauses and spaces.
>
> Research Hypothesis 2: Performances on the segmentation tasks, as measured by the total number of words divided at their respective potential pauses and spaces, will not differ significantly with the presentation of the segmentation task in an aural or visual context.
>
> Research Hypothesis 3: The grade levels of the children (pre-school, kindergarten, first grade) will have no differential effect on the performance of the segmentation tasks in the aural and visual contexts.

> Research Hypothesis 4: Children with increasing reading abilities (non-readiness, readiness, reader) will exhibit an increasing proficiency in their ability to segment words as measured by the total number of words divided at their respective potential pauses and spaces.

> Research Hypothesis 5: The reading ability of the children (non-readiness, readiness, reader) will have no differential effect on the performance of the segmentation tasks in the aural and visual contexts.

Because Research Hypotheses one through five examine the children's total performance on the segmentation tasks, descriptive information about error patterns could not be investigated through the hypotheses. Existing research on the visual context suggested that configuration and length cues may be criteria for word boundaries. From the aural context research the conclusion was that meaning was the criterion for identifying a unit in speech. In the paired aural-visual context research, one study showed that form class was the criterion used in the aural context. Consequently, the decision was to seek systematic patterns of errors in the visual context and in the aural context in order to discover the criteria the children might have used to define word boundaries. The following research question was formulated:

> Research Question 1: Is there a consistent, systematic error pattern in the performances of pre-school, kindergarten, and first grade children on the visual and aural segmentation tasks?

Thus, comparable segmentation tasks in the aural and the visual contexts were presented to children in three different grade levels (pre-school, kindergarten, and first

grade) and to children with three different reading abilities (non-readiness, readiness, reader) in order to investigate the development of children's concept of the linguistic segment word.

Children's understanding of reading terminology was investigated using the terms letter, word and sentence in an explanation task and a recognition task. Since the conclusions from the existing reading terminology research differed as to when mastery was achieved, the decision was to include children in different grade-levels (pre-school, kindergarten, first grade) and with different reading abilities (non-readiness, readiness, reader).

Since the recognition task probably required only comprehension and the explanation task probably required both comprehension and verbalization abilities for successful performances, the decision was to compare the performances on the two tasks. The different requirements of the two tasks were expected to be reflected in the number of successful performances exhibited by the children.

Thus, to investigate developmental differences in children's metalinguistic understanding of reading terminology, the following research questions were formulated:

> Research Question 2: Are the children's abilities to explain the terminology of reading (letter, word, sentence) on an explanation task reflective of the grade level (pre-school, kindergarten, first grade) and/or the reading ability (non-readiness, readiness, reader) of the children?

> Research Question 3: Are the children's abilities to comprehend the terminology of reading (letter, word, sentence) on a recognition task reflective of the grade level (pre-school, kindergarten, first grade) and/or the reading ability (non-readiness, readiness, reader) of the children?
>
> Research Question 4: Are the pre-schoolers', kindergarteners' and first graders' respective performances on the recognition task comparable to the pre-schoolers', kindergarteners' and first graders' respective performances on the explanation task?

Since metalinguistic understanding included the two cognitive clarity components of linguistic segments and reading terminology, a remaining question was whether the children's performances on the respective tasks would be similar. Therefore, the following research question was posed.

> Research Question 5: Are the pre-schoolers', kindergarteners' and first graders' respective performances on the segmentation tasks similar to the pre-schoolers', kindergarteners' and first graders' respective performances on the comprehension of reading terminology tasks?

Thus, children's metalinguistic understanding was investigated through their concept of the linguistic segment of word and their understanding of reading terminology.

# CHAPTER TWO

## METHOD

This investigation of the development of metalinguistic understanding sought to describe young children's understanding of the basic unit in reading -- the word. Did young children understand the word differently? If they did, could these developmental trends or differences in task performances be accounted for? To answer these questions subjects from three different grade levels were obtained, materials and procedures for the tasks devised, and performances on the tasks analyzed. Descriptions of the subjects, the materials, the procedures, and the analyses compose the sections of this chapter.

### Subjects

A random sample of fifteen children for each grade level -- pre-school, kindergarten, and first grade -- was selected from the general population of the elementary school and the pre-school serving a small, rural-suburban town in central Wisconsin. The total sample included forty-five children.

The children were screened for an understanding of the concept of "one" needed for the recognition array task.

Each child was asked to select a card with one apple on it from an array of cards with pictures of one, two, or three apples. Since all children demonstrated an understanding of the concept of "one," no child was excluded from the original sample.

The children were reclassified by reading ability so that differences reflective of reading ability could be investigated. The reading level of each child was informally determined by a procedure used by Harty (1975) which was a refinement of a procedure used by Durkin (1964). The informal procedure consisted of three sets of materials. For the first set of materials, the twenty-six letters of the alphabet were written in black, lower case, manuscript letters in a centered one-inch space on blue 4x6 index cards. For the second set, five words were randomly selected from the ten listed on the pre-primer level of Johnson's Informal Diagnostic Reading Test (in Smith and Johnson, 1976, pp. 213-221) graded word lists. The five words ("big," "up," "look," "good," "to") were written in black, lower case, manuscript letters in the center of yellow 4x6 index cards. For the third set, two sentences were composed from the pre-primer word list on Johnson's Informal Diagnostic Reading Test (in Smith and Johnson, 1976, pp. 213-221). The two sentences ("Look up at me." "It is a big dog.") were written in black manuscript letters in the center of white 4x6 index cards (refer to

Appendix A).

Each child was presented the alphabet cards first and, if successful, presented the word cards and then the sentence cards. Harty (1975) formulated three categories of reading ability:

1. Non-readiness Category. Children could not identify by name twenty letters of the alphabet.
2. Readiness Category. Children could identify by name twenty of the letters shown.
3. Reader Category. Children could read four of the five words on the pre-primer level and could read four of the five words in a sentence.

The forty-five children in the sample were reclassified according to reading ability as shown in Table 2.1. The reclassification resulted in 13 children in the non-readiness category, 14 children in the readiness category, and 18 children in the reader category.

Table 2.1

THE NUMBER OF CHILDREN IN EACH READING ABILITY CLASSIFICATION

| | Reading Ability Category | | |
|---|---|---|---|
| Grade Level | Non-Readiness | Readiness | Reader |
| Pre-school | 7 | 5 | 3 |
| Kindergarten | 6 | 8 | 1 |
| First Grade | 0 | 1 | 14 |
| TOTAL | 13 | 14 | 18 |

Materials

Segmentation task. In both the aural and visual contexts, the word strings were formed using the following sentence types (Quirk and Greenbaum, 1973):

1. Subject Verb Complement
2. Subject Verb Object
3. Subject Verb Object Object
4. Subject Verb
5. Command

For each type, two sentences were composed. The two sentences differed in length by two words. The length range for all the sentences was from two to seven words.

The lexical items were selected from the "Dale List of 3000 Familiar Words" (in Dale and Chall, 1948). The lexical items used varied in the number of syllables (one to three) and in their visual configurations (ascending and descending letters; long and short words). To balance the lexical items, a third sentence of the subject-verb-object-object type was added.

The final set of sentences consisted of the following types of sentences:

2 practice sentences of the subject-verb type

2 test sentences of the subject-verb-complement type

2 test sentences of the subject-verb-object type

3 test sentences of the subject-verb-object-object type

2 test sentences of the subject-verb type

2 test sentences of the command type

The resulting thirteen sentences were judged by reading experts to resemble basal reading materials (see Appendix B).

For the aural context, four random orders were randomly chosen. Four tapes of the two practice sentences and then the eleven randomly ordered test sentences were recorded (see Appendix C). One of the four tapes was randomly selected for the aural context task for each child.

For the visual context, each sentence was printed in primary type on an 8½x2½ strip of paper. The eleven test sentences were randomly collated and stapled after the two practice sentences. The particular set presented to the child was randomly selected (see Appendix D).

Questions about reading terminology. The materials for this section of the study consisted of oral questions asked by the experimenter. The following set of questions was asked about each of the terms of reading (letter, word, sentence):

> What is a (letter)? How do we use (letters)?
> Tell me any (letter) you know.

The presentation order of the three terms was random (see Appendix E).

Recognition array of examples of reading terminology. The materials for the recognition array consisted of two examples of a letter, a word, a sentence, and a number. The two letters were randomly selected from an alphabet which excluded the letters "a" and "i" because those letters can

also be classified as words, and which excluded the letter "l" because it can also be classified as the number one. The two letters randomly chosen were "m" and "f". The word examples were randomly selected from Johnson's "Basic Vocabulary for Beginning Readers" (1971) which contains 306 words. The two words selected were "never" and "there". The sentence examples were composed of words from Johnson's Basic Vocabulary -- First Grade Words (Johnson and Majer, 1976), which contains 180 words. The sentences ("The children run." and "The girl is going home.") were judged by reading experts to be representative of first grade basal reading programs. The two numbers were randomly selected from a set ranging from 1 to 9. The numbers chosen were "3" and "6".

Thus, the recognition array consisted of the following examples (Appendix F).

| | | |
|---|---|---|
| Letter: | m | f |
| Word: | never | there |
| Sentence: | The children run. | The girl is going home. |
| Number: | 3 | 6 |

Each example was written in black manuscript print in the center of a 4x6 white index card.

Procedures

The interview with each child was recorded to facilitate the scoring of the child's answers to questions and the child's responses on the aural segmentation task.

Each subject was presented with five sets of stimuli

in the following order:

1. questions to elicit explanations of reading terminology
2. recognition array of examples of reading terminology
3. first segmentation task
4. reading ability classification task
5. second segmentation task

The explanation task was the initial activity so that the child could not transfer information from the other tasks to aid her answers. Informal conversation between child and the experimenter established a comfortable atmosphere for the task situation.

The order of presentation of the segmentation contexts was balanced so that half of the children received the visual context first and the aural context second, while the other half of the children received the aural and then the visual. This procedure was used so that the effects of presentation order and the effects of context were counterbalanced. The reading ability classification task was presented after the first segmentation task to provide interference and to reduce transfer from the first segmentation task to the second.

Segmentation tasks. The purpose of the segmentation tasks was to investigate the ability of young children to isolate each example of a word from the contextual string of words in the aural context and the visual context. One

half of the children received the visual context first, while the other half received the aural context first.

Performances on the aural context were examined through a task used by Karpova (1955) which consisted of three steps:

1. The child heard a string of words.
2. The child repeated the string of words.
3. The child simultaneously said the words and moved a poker chip for each word.

A pilot sample of pre-school and kindergarten children were asked to complete Karpova's (1955) task so that the procedure could be tested. Since the children in the pilot were unable to repeat the string of words and to move a poker chip simultaneously, the third step was altered. The first alteration of tapping a finger and repeating the sentence was abandoned because the pre-schoolers tapped too softly to be accurately recorded. Consequently, the task was again changed to simultaneously knocking with a fist and repeating the string of words. This knocking procedure was performed easily by all of the children in the pilot sample. Thus, the three steps used were:

1. The child heard a tape recording of a string of words.
2. The child repeated the string of words.
3. The child simultaneously knocked with a fist as she said each word in the string of words.

Each child was tested using one of four tapes on which were recorded four different random orders of test

sentences (see Appendix C). Each tape began with the same two practice sentences which were used to ensure that the child understood the directions. The particular tape presented to the child was randomly selected.

Throughout the aural segmentation task, the experimenter gave the directions and operated the tape recorder so that the pace of the procedure could be adapted. The experimenter gave the following directions to introduce the task:

> "This tape recorder will play some sentences.
> Listen to the sentence on the tape.
> Say the sentence.
> Then say the sentence and knock for each word you say."

The experimenter then played the first practice sentence on the tape and repeated the specific directions as the child responded. If the child did not talk and knock simultaneously, the direction was rephrased during the second practice sentence:

> "Talk and knock at the same time."
> "Knock for each word you say."

The experimenter continued to use whichever phrasing the child seemed to understand. For each sentence, the experimenter repeated the procedure below:

1. Gave the direction -- "Listen to the next sentence."
2. Turned on the tape.
3. Stopped the tape.
4. Gave the direction -- "Say the sentence."
5. Paused for the child's response.

6. Gave the direction -- "Say the sentence and knock for each word you say." -- or an alternate phrasing.

7. Paused for the child's response.

Performances on the visual context were examined through a task used by Meltzer and Herse (1969). The child was presented with a string of words printed in primary type on a strip of paper (see Appendix D). Using a crayon, the child circled each word in the string. The experimenter collected each strip before presenting the next one.

Each child was tested with a randomly ordered set of sentences. The particular set presented to the child was randomly chosen.

Each set of sentences began with the same practice sentences which were used to ensure that the child understood the directions:

"Circle each word you see."

If the child did not circle each word in the first practice sentence, one of the following rephrasings was used for the second practice sentence:

"Put a circle around each word."
"Give each word its own circle."

The experimenter repeated the directions -- "Circle each word you see." -- or a rephrasing as she presented each strip.

Questions about reading terminology. The purpose of the questions was to investigate the ability of the young children to explain reading terminology. The experimenter

introduced the task and the testing situation in the following manner:

> "I am going to ask you some questions.
> You may need to think hard to answer the questions.
> If you can't think of an answer, just say I don't know.
> Are you ready to think?"

Then the experimenter asked the interview questions, pausing for the child's answer after each question:

> What is a (letter)?
> How do we use (letters)?
> Tell me any (letter) you know.

A similar set of questions was asked for word and sentence (see Appendix E). The order in which each child was questioned about the three terms was random.

Recognition array of examples of reading terminology. The purpose of the recognition array was to explore the ability of the young child to identify an isolated example of the terms without the requirement of verbalization. The recognition array activity occurred after the interview questions so that the examples would not influence the child's explanation of the terms.

Eight separate cards (two each for number, letter, word, and sentence) were randomly laid in front of the child (see Appendix VI). Examples of numbers were included because Reid (1966) and Downing (1969-70, 1970, 1971-72) reported the use of the term number for the term letter.

The child was requested to "Point to a card with just one (letter) on it." The request was repeated for word, and

sentence. After each selection by the child, the cards were shuffled and randomly arranged in front of the child before the next request. The order of the requests for the three examples was random for each child.

If a child selected a card with more than one item on it (as a word card for a letter request), the child was asked to circle one letter with his finger. In this manner, if the child had selected a word card because it had multiple letters on it, the experimenter was able to detect whether the child could recognize a single letter.

Analysis of the Data

The specific analyses of the data will be presented in conjunction with the respective research hypotheses and questions which the analyses are designed to test.

Research hypotheses. The research hypotheses were tested using the segmentation task. The responses in the aural context and the visual context were designated correct or incorrect by the following criteria:

1. The responses were designated correct if the words were split apart in the potential pauses and spaces.

2. The responses were designated incorrect if there was any deviation from the potential pauses and spaces.

For example, the test sentence "A dog barked." should be marked with three circles on the visual context task and by three knocks on the aural context task. The correct score for the sentence would be three on the visual con-

text, three on the aural context, and six for the total segmentation performance. On the visual context task, violations of the potential spaces were primarily either a combination of two words (one circle around "A dog") or a division of a word (two circles around "barked"). No credit was given for either the combination errors or the division errors. Similarly, on the aural context task, violations of the potential pauses were primarily either combination errors (one knock for "A dog") or division errors (two knocks for "barked"). Credit was given for the word on which the knock occurred in combination errors. The division errors, which syllabicated words, received no score.

Thus, a score was obtained for the aural context and a score for the visual context by summing the correctly marked potential pauses and potential spaces, respectively. The sum of the aural and visual scores was the total segmentation task score. These summed scores were the data for testing the five research hypotheses.

Since a review of the related literature led to a prediction of increasing proficiency in accordance with the testing of older children, the following directional hypothesis was formulated:

> Research Hypothesis 1: Pre-schoolers, kindergarteners, and first graders will exhibit an increasing proficiency in their ability to segment words as measured by the total number of words divided at their respective potential pauses and spaces.

The directional hypothesis was tested through the use of two planned comparisons using an F ratio procedure (Kirk, 1968) with the significance level set at .05:

a. First graders and kindergarteners will exhibit no greater proficiency than pre-schoolers in their ability to segment words as measured by the total number of words divided at their respective potential pauses and spaces.

b. First graders will exhibit no greater proficiency than kindergarteners in their ability to segment words as measured by the total number of words divided at their respective potential pauses and spaces.

Since no prediction could be made about the effects of context or the effects of interaction, the research hypotheses for context effects and for an interaction effect translated into identical statistical hypotheses of no difference.

Research Hypothesis 2: Performance on the segmentation tasks, as measured by the total number of words divided at their respective potential pauses and spaces, will not differ significantly with the presentation of the segmentation task in an aural or visual context.

Research Hypothesis 3: The grade levels of the children (pre-school, kindergarten, first grade) will have no differential effect on the performance of the segmentation tasks in the aural and visual contexts.

The hypotheses of no difference were tested by a Split-Plot ANOVA (Kirk, 1968). Since repeated measures occurred in the context treatment, the Geisser-Greenhouse conservative F-test (in Kirk, 1968, pp. 142-143) was used to test for significance.

A review of the related literature had led to a pre-

diction of increasing proficiency in performance in accordance with increasing ability to read:

> Research Hypothesis 4: Children with increasing reading abilities (non-readiness, readiness, reader) will exhibit an increasing proficiency in their ability to segment words as measured by the total number of words divided at their respective potential pauses and spaces.

The directional hypothesis was tested through the use of two planned comparisons using the Dunn procedure (Kirk, 1968) with the significance level set at .05:

> c. Readers and readiness children will exhibit no greater proficiency than non-readiness children in their ability to segment words as measured by the total number of words divided at their respective potential pauses and spaces.
>
> d. Readers will exhibit no greater proficiency than readiness children in their ability to segment words as measured by the total number of words divided at their respective potential pauses and spaces.

Since no prediction could be made about the interaction effect of context and reading ability, the research hypothesis for interaction effects translated into an identical statistical hypothesis of no difference:

> Research Hypothesis 5: The reading ability of the children (non-readiness, readiness, reader) will have no differential effect on the performance of the segmentation tasks in the aural and visual contexts.

A Split-Plot ANOVA (Kirk, 1968) was used to test for any interaction effects between reading ability and context. Since unequal cells occurred when the children were classified by reading ability, the unweighted means solution (Kirk, 1968, pp. 276-279) was used. Since the context

treatment used repeated measures, the Geisser-Greenhouse conservative F-test (in Kirk, 1968, pp. 142-143) was used to test for significance.

A post-hoc analysis was planned for any of the effects which showed significance in the overall F-tests.

Research questions. To answer the descriptive research questions about a child's concept of a word the error patterns of the responses to the segmentation task, the responses to the reading terminology questions, and the responses to the recognition array were used. Each research question will be presented and followed by the appropriate data analysis.

> Research Question 1: Is there a consistent, systematic error pattern in the performance of pre-school, kindergarten, and first grade children on the visual and aural segmentation tasks?

The segmentation task responses were tabulated for error patterns by the following criteria:

1. The child segmented with both contexts at the appropriate potential pauses and potential spaces.
2. The child segmented with the visual context at the appropriate potential spaces but not appropriately with the aural context.
3. The child segmented with the aural context at the appropriate potential pauses but not appropriately with the visual context.

In addition to the above criteria, the inappropriate response patterns with the visual context and the aural context were analyzed for any systematic patterns.

Research Question 2: Are the children's abilities to explain the terminology of reading (letter, word, sentence) on an explanation task reflective of the grade level (pre-school, kindergarten, first grade) and/or the reading ability (non-readiness, readiness, reader) of the children?

The answers to the questions about reading terminology are reported descriptively using the following categories:

1. The child supplied a correct explanation and example by adult native speaker standards.

2. The child substituted an incorrect term or substituted the explanation of another term, as numbers are used in words.

3. The child supplied a semantic interpretation of the term -- A letter is mailed.

The proportion of children for each grade level and each reading ability whose responses were classified in the above three categories are reported.

Research Question 3: Are the children's abilities to comprehend the terminology of reading (letter, word, sentence) on a recognition task reflective of the grade level (pre-school, kindergarten, first grade) and/or the reading ability (non-readiness, readiness, reader) of the children?

The responses to the recognition array were analyzed after tabulating the example selected for each term requested:

1. The child correctly selected the example requested.

2. The child selected one of three incorrect items.

The number of responses for each correct item and for each incorrect item was tabulated for each requested item on a chart similar to the one on the following page:

| | | Item Selected | | | | |
|---|---|---|---|---|---|---|
| | | number | letter | word | sentence | no answer |
| Item Requested | letter | | | | | |
| | word | | | | | |
| | sentence | | | | | |

For each item requested, the proportion of correct and incorrect responses for each grade level and reading ability were reported. A chi-square test (Kirk, 1968) was used to determine whether the differences between grade levels and reading abilities were significant. The incorrect responses were examined to determine whether one incorrect response was more likely to be selected than the other when each specific request was made.

> Research Question 4: Are the pre-schoolers', kindergarteners', and first graders' respective performances on the recognition task comparable to the pre-schoolers', kindergarteners', and first graders' respective performances on the explanation task?

Research question 4 was formulated to determine whether the hypothesized differing task requirements on the recognition task and on the explanation task were reflected in the number of successful performances. Therefore, within each grade level, the number and percentage of correct performances on the recognition task were compared to the number and percentage of correct performances on the explanation task.

> Research Question 5: Are the pre-schoolers', kindergarteners', and first graders' respective performances on the segmentation tasks similar to the pre-schoolers', kindergarteners', and first graders' respective performances on the comprehension of reading terminology tasks?

Research Question 5 was formulated to determine whether each respective grade level performed similarly on all of the metalinguistic tasks, even though each task seemed to require different abilities. Therefore, the number and percentages of correct performances on the four tasks were compared within each grade level. For example, the number of pre-schoolers who performed successfully on the recognition task, were compared to the number of pre-schoolers who performed successfully on the explanation task and to the number of pre-schoolers who performed successfully on the two segmentation tasks.

To provide a uniform basis for the comparison, percentages of successful performances were calculated and the following guidelines were used to determine whether a task was difficult or easy for each grade level:

1. A task was considered difficult if 0% to 40% of the children in the grade level successfully completed the task.

2. A task was considered of intermediate difficulty if 41% to 70% of the children in the grade level successfully completed the task.

3. A task was considered easy if 71% to 100% of the children in the grade level successfully completed the task.

# CHAPTER THREE

## RESULTS AND DISCUSSION

The organization of Chapter Three is the presentation of the Research Hypotheses and the respective results and related discussion, followed by the presentation of the Research Questions, the respective results, and related discussion.

### Research Hypotheses

Research Hypotheses One through Five were stated to examine the proficiency of children in different grade levels and with different reading abilities to perform the segmentation task; the effects of the aural and visual contexts of the segmentation task; and the interaction effects. The data were obtained by summing the correctly marked potential pauses (aural context) and potential spaces (visual context) on the segmentation task.

> Research Hypothesis 1: Pre-schoolers, kindergartenders, and first graders will exhibit an increasing proficiency in their ability to segment words as measured by the total number of words divided at their respective potential pauses and spaces.

As reported in Table 3.1, mean performance scores increased as children in higher grade levels were tested with the aural context and with the visual context. The

Table 3.1

MEAN PERFORMANCE SCORES ON THE SEGMENTATION TASK BY CHILDREN IN DIFFERENT GRADE LEVELS

| Grade Level[a] | Segmentation Task | |
|---|---|---|
| | Aural Context | Visual Context |
| Pre-School | | |
| Mean | 35.93 | 27.13 |
| SD | 4.72 | 19.28 |
| Kindergarten | | |
| Mean | 35.73 | 33.67 |
| SD | 4.09 | 17.39 |
| First Grade | | |
| Mean | 45.27 | 46.67 |
| SD | 3.45 | 10.73 |

[a]n=15 for each grade level.

standard deviations of the performance scores on both contexts decreased as higher grade levels were tested. Thus, as higher grade levels were tested on both contexts, the children achieved higher scores, and more children achieved similar scores.

The data are depicted graphically in Fig. 3.1. The increasing performance scores on the visual context are depicted by a line, which steadily increases as scores for higher grade levels are plotted. The increasing performance scores on the aural context are exhibited by a sharp rise in the line at the first grade point only.

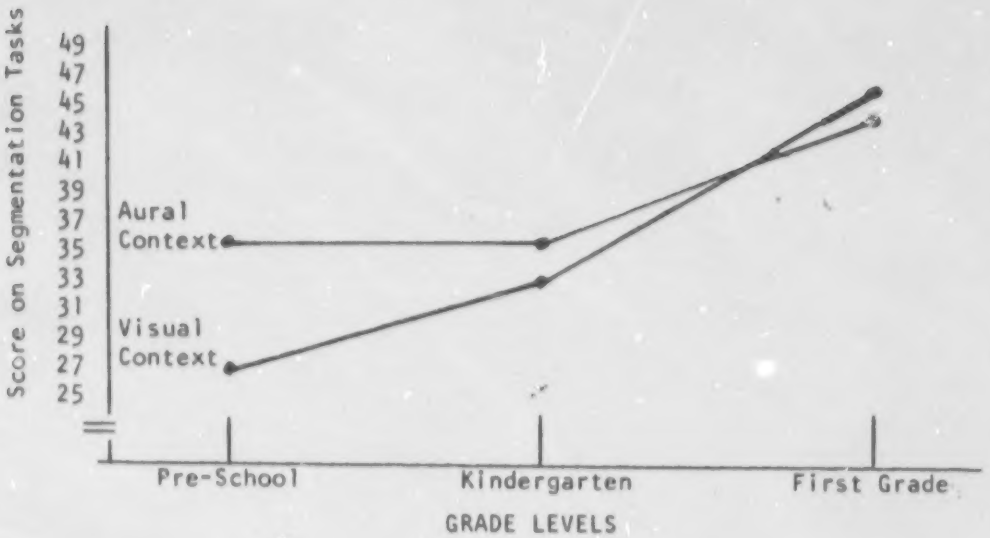


Fig. 3.1. Aural Context and Visual Context Performance Scores by Children in Different Grade Levels

Thus, Table 3.1 and Fig. 3.1 exhibit the increasing proficiency of the children at the higher grade levels, which was predicted in Research Hypothesis 1.

Since Research Hypothesis 1 predicted increased proficiency as higher grade levels were tested, two planned comparisons were formulated to test statistically the trends that were indeed found in the increased mean performance scores (Table 3.1). The following two planned comparisons were tested, using the Dunn procedure (Kirk, 1968), with a significance level of .05:

$\Psi_a$--First graders and kindergarteners will exhibit no greater proficiency than pre-schoolers in their ability to segment words as measured by the total number of words divided at their respective potential pauses and spaces.

$\Psi_b$--First graders will exhibit no greater proficiency than kindergarteners in their ability to segment words as measured by the total number of words divided at their respective potential pauses and spaces.

The results of the planned comparisons ( $\Psi_a$, $\Psi_b$) are presented in Table 3.2. The differences between the proficiency of first graders and kindergarteners as compared to the proficiency of pre-schoolers in their ability to segment words ( $\Psi_a$) was significant ($F = 9.09$, df 1/42, $p < .01$). The difference between the proficiency of first graders as compared to the proficiency of kindergarteners in their ability to segment words ( $\Psi_b$) was significant ($F = 11.21$), df 1/42, $p < .01$).

Table 3.2

ANALYSIS OF VARIANCE SUMMARY TABLE FOR GRADE LEVEL GROUPS ON THE SEGMENTATION TASK

| Source | SS | df | MS | F |
|---|---|---|---|---|
| Grade Level | | | | |
| $\Psi_a$ | 1550.02 | 1 | 1550.02 | 9.09* |
| $\Psi_b$ | 1905.63 | 1 | 1905.63 | 11.21* |
| Segmentation Task | 224.04 | 1 | 224.04 | 1.72 |
| Segmentation Task X Grade Level | 403.48 | 2 | 201.74 | 1.55 |
| Error | 5458.32 | 42 | 129.96 | |
| TOTAL | 16685.42 | | | |

*$p$ .01.

Consequently, the two statistical hypotheses stated in the form of planned comparisons were rejected. As predicted in Research Hypothesis 1, pre-schoolers, kindergarteners and first graders exhibited an increasing proficiency in their ability to segment words at the appropriate potential pauses and spaces. The results supporting Research Hypothesis 1 are also in line with the previous research on the aural context. Karpova (1955), Holden (1972), and Ehri (1975) found that the older children, in their respective studies, performed better on the respective aural context tasks than the younger children did.

The results supporting Research Hypothesis 1 extended the research on the visual context and the paired aural-visual context. Since only one grade level was included in each study of the visual context research and paired context research, a progression of proficiency on the respective tasks could not be demonstrated. Since the current study included three grade levels, a progression of increasing proficiency in performance on a visual task and on a paired aural-visual task can now be inferred.

> Research Hypothesis 2: Performance on the segmentation tasks, as measured by the total number of words divided at their respective potential pauses and spaces, will not differ significantly with the presentation of the segmentation task in an aural or visual context.

> Research Hypothesis 3: The grade levels of the children (pre-school, kindergarten, first grade) will have no differential effect on the performance of the segmentation tasks in the aural and visual contexts.

The mean performance scores presented in Table 3.1 and the context performance scores graphed in Fig. 3.1 seemed to indicate a difference in performance due to the context of the segmentation task. As graphed in Fig. 3.1, the steady vertical increase in performance scores on the visual context task is in contrast to the varied picture of the aural performance scores. The aural performance scores exhibited no increase for the earlier grade levels, followed by a sharp increase for the first grade level. Thus, a context effect may have influenced the performances on the segmentation task.

An interaction effect is indicated by the better performance on the aural task by the pre-schoolers and kindergarteners, contrasted to the better performance on the visual context by the first graders (Table 3.1). The crossed lines in Fig. 3.1 depict a differential effect, which context might have had when different grade levels performed. Thus, an interaction effect between context and grade level might have influenced the performances on the segmentation task.

To test the context effect and the interaction effect indicated by the mean scores, the Research Hypotheses 2 and 3 were translated into identical statistical hypotheses of no difference, and tested by a Split-Plot ANOVA (Kirk, 1968). Since repeated measures occurred in the context treatment, the Geisser-Greenhouse conservative F-test (in Kirk, 1968,

pp. 142-143) was used to test for significance. The Geisser-Greenhouse conservative F-test reduced the degrees of freedom allowed in the F-test, because the repeated measures were probably not independent. Because only two repeated measures were used, the degrees of freedom were not different when figured conventionally or conservatively.

The results are presented in Table 3.2. The difference in the mean performance scores of the aural and visual contexts was not significant ($F = 1.72$, $df = 1/42$). The interaction between context and grade level was not significant either ($F = 1.55$, $df = 2/42$).

Consequently, the statistical and research hypotheses stating no difference in performance on the segmentation task when presented in the aural or visual context were not rejected. The statistical and research hypotheses, stating that grade level would have no differential effect on performance of the segmentation tasks in the two contexts, were also not rejected.

The statistical and research hypotheses were stated in terms of no difference for the context effect, because the previous research provided no indication about the direction to predict. The separate research on the visual context and on the aural context used different criteria for the selection of their respective stimuli. Since incomparable stimuli were used, a generalization about the effect of context could not be made from the separate

context studies. The paired aural-visual research should have indicated a direction for the hypotheses, but only one study (Figa, 1972) presented comparable stimuli on the aural and the visual tasks. Thus, no prediction was made, because no comparability between the contexts could be found.

Using comparable stimuli in both contexts, Figa (1972) found no consistent relationship between the first graders' performances with the two contexts. The first graders who scored high on the aural context, scored either high or low on the visual context. In contrast, the current study did find an indication of a relationship. The first graders' mean performance score on the visual context was higher than their mean performance score on the aural context, although the difference was found to be non-significant.

Although Holden and MacGinitie (1972) continually revised the stimuli presented to the kindergarteners, they did state that aural segmentation ability was necessary for correct visual segmentation. The finding of no statistical difference in the performance with the two contexts in the current study does not support the necessity of mastery in the aural context before mastery in the visual context.

If only kindergarteners had been studied in the current study, then Holden and MacGinitie's conclusion might have been supported. The kindergarten performance scores were higher in the aural context than in the visual context. But the inclusion of pre-schoolers' and first graders' per-

formances altered the conclusion. Although no significance was found, there was an indication of an interaction between grade level and context of the task. The aural context did not improve until the visual context performance was also high. The visual context performance exhibited a steady rise, which might have been a reflection of the children's realization of print or consciousness of the printed form of language. After a constant performance level, the subsequent sharp rise in the aural context performance might have been a reflection of the visual context learnings transferred to the aural context. Thus, mastery in the visual context may be necessary for mastery in the aural context.

> Research Hypothesis 4: Children with increasing reading abilities (non-readiness, readiness, reader) will exhibit an increasing proficiency in their ability to segment words as measured by the total number of words divided at their respective potential pauses and spaces.

When the children were reclassified by reading ability, mean scores of their performances with both contexts increased as their reading ability increased (Table 3.3). The standard deviations for the performance scores on the visual context were numerically greater than on the aural context. As shown in Table 3.3, the standard deviations for the visual context performance scores decreased when readers were tested, while the standard deviations for the aural context remained similar.

Table 3.3

MEAN PERFORMANCE SCORES ON THE SEGMENTATION TASK
BY CHILDREN WITH DIFFERENT
READING ABILITIES

| Reading Abilities | Segmentation Task | |
|---|---|---|
| | Aural Context | Visual Context |
| Non-readiness (n=13) | | |
| Mean | 34.31 | 21.92 |
| SD | 4.55 | 16.64 |
| Readiness (n=14) | | |
| Mean | 37.00 | 34.07 |
| SD | 4.28 | 18.05 |
| Reader (n=18) | | |
| Mean | 43.89 | 47.22 |
| SD | 4.41 | 9.896 |

The increasing proficiency of the children with more reading ability is depicted in Fig. 3.2. The increasing performance scores on the visual context are depicted by the steeply sloped line. The increasing performance scores on the aural context are depicted by a more gradually sloped line.

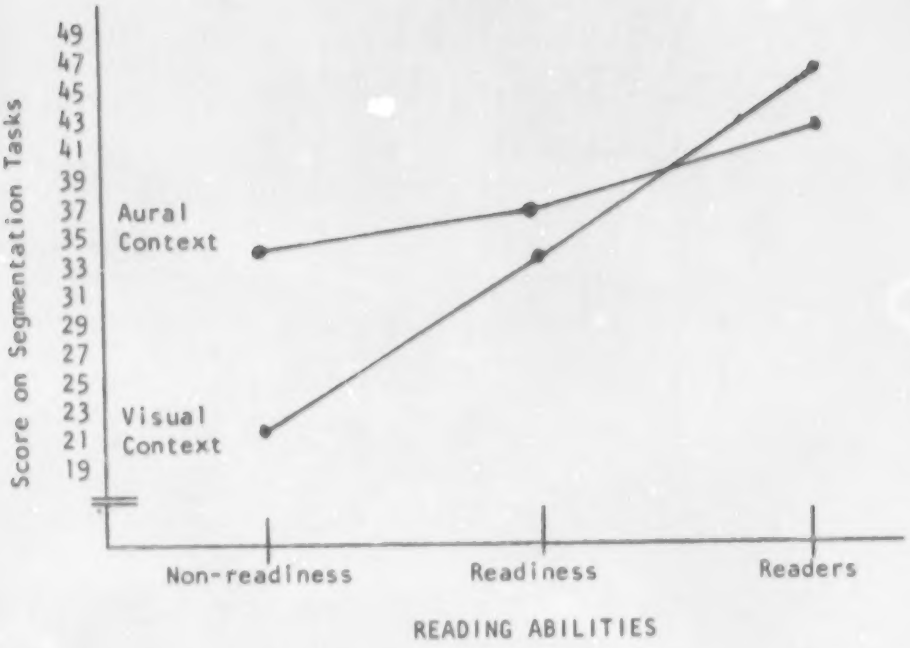


Fig. 3.2. Aural Context and Visual Context Performance Scores by Children with Different Reading Abilities.

Thus, Table 3.3 and Fig. 3.2 exhibit the increasing proficiency of the children of increasing reading ability, as was predicted in Research Hypothesis 4.

Since Research Hypothesis 4 predicted an increasing proficiency in performance as children of increasing reading abilities were tested, two planned comparisons were formulated to statistically test the prediction. The following two planned comparisons were tested using the Dunn procedure (Kirk, 1968) with a significance level of .05:

$\psi_c$-- Readers and readiness children will exhibit no greater proficiency than non-readiness children in their ability to segment words as measured by the total number of words divided at their respective potential spaces and pauses.

$\psi_d$-- Readers will exhibit no greater proficiency than readiness children in their ability to segment words as measured by the total number of words divided at their respective potential spaces and pauses.

The results of the planned comparisons ($\psi_c$, $\psi_d$) are presented in Table 3.4. The difference in the proficiency of readers and readiness children as compared to the proficiency of non-readiness children in their respective abilities to segment words ($\psi_c$) was significant ($F$ = 20.36, $df$ 1/42, $p < .01$). The difference in the proficiency of readers as compared to the proficiency of readiness children in their respective abilities to segment words ($\psi_d$) was significant ($F$ = 11.318, $df$ 1/42, $p$ .01).

Table 3.4

ANALYSIS OF VARIANCE SUMMARY TABLE FOR READING ABILITY GROUPS ON THE SEGMENTATION TASK

| Source | SS | df | MS | F |
|---|---|---|---|---|
| Reading Ability | | | | |
| $\gamma_c$ | 2844.82 | 1 | 2844.82 | 20.362* |
| $\gamma_d$ | 1581.015 | 1 | 1581.015 | 11.318* |
| Segmentation Task | 351.92 | 1 | 351.92 | 2.999*** |
| Segmentation Task X Reading Ability | 932.96 | 2 | 466.48 | 3.97** |
| Error | 4929.12 | 42 | 117.36 | |
| TOTAL | 16813.66 | | | |

*p .01
**p .05
***p .10

Consequently the two statistical hypotheses stated in the form of planned comparisons were rejected. As predicted in Research Hypothesis 4, children of increasing reading ability exhibited an increasing proficiency in the ability to segment words at the appropriate potential pauses and spaces.

Only two previous studies classified the children as readers or pre-readers. Ehri (1975) found that the readers performed better than the pre-readers on the aural tasks presented. Michish (1974) found that more readers correctly performed her confounded visual task than did readiness

children. No one who investigated both the aural and visual contexts examined the children for their reading ability. Thus, the current study concurred with Ehri (1975) and Michish (1974). Readers are more proficient on the segmentation task than children of lesser reading ability.

In addition, the current study classified the pre-reading children into either readiness ability or non-readiness ability. A progression was again found. Readiness children were more proficient on the segmentation task than non-readiness children.

Thus, the ability to read and the ability to perform the segmentation task seem to be developing in a parallel manner.

> Research Hypothesis 5: The reading ability of the children (non-readiness, readiness, reader) will have no differential effect on the performance of the segmentation tasks in the aural and visual contexts.

The mean performance scores presented in Table 3.3 and Fig. 3.2 seemed to indicate an interaction between the context of the segmentation task and the reading ability of the children. Readers performed better on the visual task, while non-readiness and readiness children performed better on the aural task.

To test the interaction effect indicated by the mean scores, Research Hypothesis 5 was translated into an identical statistical hypothesis of no differential effect and tested by a Split-plot ANOVA (Kirk, 1968). Since unequal

cells occurred when the children were reclassified by reading ability, the unweighted means solution (Kirk, 1968, pp. 276-279) was used. Since the context treatment used a repeated measures test, the Geisser-Greenhouse conservative F-test (Kirk, 1968, pp. 142-143) was used to limit the degrees of freedom. The use of only two repeated measures resulted in no differences between the conventional and conservative degrees of freedom.

As presented in Table 3.4, the interaction between the context of the segmentation task and the reading ability of the children was significant ($F = 3.97$, df 2/42, $p < .05$). Consequently, the statistical and research hypotheses stating no interaction between the contexts of the segmentation tasks and the reading ability of the children were rejected.

To investigate the significant interaction effect found in the overall F-test, a post-hoc analysis was done, using Scheffe's Method (Kirk, 1968). Three different comparisons were done. Two comparisons were not significant. Non-readiness average performances opposed to readiness average performances ($F = 5.556$, df 2/42) and readiness average performances opposed to reader's average performances ($F = 1.37$, df 2/42) were not significant. The third comparison -- non-readiness average performances opposed to reader's average performances ($F = 7.955$, df 2/42) was significant at the .05 level.

Thus, the significant result when non-readiness and

readers were compared indicated that the differential performance with the contexts was related to the reading ability of the children. The non-significant result obtained when readiness children were tested may be a reflection of the transitional stage occupied by the readiness children. The readiness children's aural performances were similar to non-readiness children's performances, and so no significant difference was found between their performances. Yet the readiness children's performances on the visual context were more similar to the reader's performances, sothat again no significant difference was found between their performances.

In summary, the following results can be stated from the statistical testing of the Research Hypotheses One through Five:

1. Pre-schoolers, kindergarteners, and first graders exhibited an increasing proficiency in their ability to segment words at the appropriate potential pauses and spaces ($p < .01$).

2. Children with increasing reading abilities exhibited an increasing proficiency in their ability to segment words at the appropriate potential pauses and spaces ($p < .01$).

3. The interaction between the context of the segmentation task and the reading abilities of the children was significant ($p < .05$).

4. The interaction effect was accounted for by the difference between the non-readiness children's performances with the two contexts and the readers' performances with the two contexts.

5. Although a context effect and an interaction effect between context and grade level were indicated by the mean performance scores, neither was statistically significant.

Research Questions

The five research questions were formulated to investigate the error patterns on the segmentation tasks, the performances on the explanation of reading terminology task, the performances on the recognition of reading terminology task and to compare the performances on all of the metalinguistic tasks. Each research question is presented, and then the respective results and related discussion are reported.

> Research Question 1: Is there a consistent, systematic error pattern in the performances of pre-school, kindergarten, and first grade children on the visual and aural segmentation tasks?

In searching for a consistent, systematic error pattern, the children's performances on the segmentation tasks were examined in four ways: (1) a general comparison between performance scores with the aural context and performance scores with the visual context; (2) an analysis of the error patterns in the performances with the visual context; (3) an analysis of the error patterns in the performances with the aural context; (4) an analysis of task variables influencing performances with both contexts.

The results of the analyses are reported in the order stated above.

Comparison of performance scores. Each child's performance on the visual and the aural segmentation task was scored according to the following criteria:

1. The child correctly segmented with both contexts at the appropriate potential pauses and potential spaces.
2. The child correctly segmented with the visual context at the appropriate potential spaces but not appropriately with the aural context.
3. The child correctly segmented with the aural context at the appropriate potential pauses but not appropriately with the visual context.

Table 3.5 presents the results of categorizing the performances by the above criteria. Only one child segmented correctly with both contexts. No child segmented correctly with the aural context only, while 18 children segmented correctly with the visual context only. More first graders (n=12) than kindergarteners (n=3) and preschoolers (n=3) correctly segmented with the visual context only.

Table 3.5

THE NUMBER OF CHILDREN IN DIFFERENT GRADE LEVELS WHO PERFORMED CORRECTLY ON THE SEGMENTATION TASKS

| Segmentation Tasks' Context | Grade Levels[a] | | | |
|---|---|---|---|---|
| | Pre-School | Kindergarten | First Grade | Total[b] |
| Both Visual and Aural Correct | 0 | 0 | 1 | 1 |
| Only Visual Correct | 3 | 3 | 12 | 18 |
| Only Aural Correct | 0 | 0 | 0 | 0 |

[a] n=15

[b] N=45

When the children were reclassified by reading ability, a difference occurred in the visual context (Table 3.6). Fifteen readers were correct with the visual context, while only two readiness children, and one non-readiness child were. The person who was correct with both contexts was a reader.

Table 3.6

THE NUMBER OF CHILDREN WITH DIFFERENT READING ABILITIES WHO PERFORMED CORRECTLY ON THE SEGMENTATION TASKS

| Segmentation Tasks' Context | Reading Abilities | | |
|---|---|---|---|
| | Non-readiness (n=13) | Readiness (n=14) | Reader (n=18) |
| Both Visual and Aural Correct | 0 | 0 | 1 |
| Only Visual Correct | 1 | 2 | 15 |
| Only Aural Correct | 0 | 0 | 0 |

Thus, in the current study, some children were able to segment correctly only with the visual context but were unable to segment correctly only with the aural context. The finding is in opposition to the finding reported by Holden and MacGinitie (1972). Holden and MacGinitie (1972) found no child could segment correctly with the visual context if she could not also segment correctly with the aural context. The two studies lead to different conclusions about children's performances with the two contexts.

When the criterion was changed from the absolute standard of 100% accuracy to a mastery standard of 80% correct, the visual context remained the easier context to segment. As presented in Table 3.7, a total of eleven children mastered the visual context task only, while just three

children mastered the aural context task only. Seventeen children mastered both contexts of the segmentation tasks. Thus, more children either mastered both contexts or the visual context only than mastered the aural context only.

Table 3.7

THE NUMBER OF CHILDREN IN DIFFERENT GRADE LEVELS WHO ACHIEVED MASTERY ON THE SEGMENTATION TASKS

| Segmentation Tasks' Context | Grade Levels[a] | | | |
|---|---|---|---|---|
| | Pre-school | Kindergarten | First Grade | Total[b] |
| Mastery on Visual Only | 4 | 6 | 1 | 11 |
| Mastery on Aural Only | 1 | 1 | 1 | 3 |
| Mastery on Both Contexts | 2 | 2 | 13 | 17 |

[a] n=15

[b] N=45

The first graders performed differently than the kindergarteners or the pre-schoolers (Table 3.7). More first graders (n=13) than kindergarteners (n=2) or pre-schoolers (n=2) mastered both contexts of the segmentation task. Consequently, more kindergarteners (n=6) than pre-schoolers (n=4) or first graders (n=1) mastered the visual context only. Only one child in each grade level mastered the aural context task only.

As presented in Table 3.8, readers performed differently than the readiness or non-readiness children did. More readers (n=15) mastered both contexts than did readiness children (n=3) or non-readiness children (n=0). Consequently, more readiness children (n=5) than non-readiness children (n=3) or readers (n=2) mastered the visual context only. Only one child in each reading ability group mastered the aural context only.

Table 3.8

THE NUMBER OF CHILDREN WITH DIFFERENT READING ABILITIES WHO ACHIEVED MASTERY ON THE SEGMENTATION TASKS

| Segmentation Tasks' Context | Reading Abilities | | |
|---|---|---|---|
| | Non-readiness (n=13) | Readiness (n=14) | Reader (n=18) |
| Mastery on Visual Only | 3 | 5 | 2 |
| Mastery on Aural Only | 1 | 1 | 1 |
| Mastery on Both Contexts | 0 | 3 | 15 |

Thus, when the criterion for successful segmentation was changed to a mastery standard, the number of children who could be classified as successful increased but the relationship of the performances with the contexts did not change. More children mastered either both contexts or the visual context only. Just three children mastered the aural

context only. In opposition to the study by Holden and MacGinitie (1972), mastery on the visual context was not necessarily accompanied by mastery on the aural context. In the current study, mastery on the aural context task seemed more difficult and occurred either concurrently or after mastery on the visual context.

In summary, from a general comparison of the performances with the visual and aural contexts of the segmentation task the following observations can be stated:

1. No child segmented correctly with the aural context only, while 18 children correctly segmented with the visual context only.
2. More first graders and more readers correctly segmented either with both contexts or the visual context only.
3. More children mastered both contexts or the visual context only than mastered the aural context only.
4. More first graders than kindergarteners or preschoolers mastered both contexts or the visual context only.
5. More readers than readiness or non-readiness children mastered both contexts or the visual context only.

Visual context errors. The performance errors with the visual context were analyzed to determine whether systematic patterns could be deduced. The following types of errors were committed with the visual context:

1. Whole Sentence -- The entire sentence was circled as a unit. One circled sentence was considered one error.
2. Individual Letter -- Each letter in a sentence was circled. One sentence on which the letters were circled was considered one error.

3. "a" omission -- The word "a" was not circled. Each omission was considered one error.

4. Division -- The long words of two or three syllables were divided into parts. The error "ch/ild/ren," was considered one division error.

5. Combination -- The short words of one to three letters were included with each other or with neighboring words. The error, "me a," was considered one combination error.

As Table 3.9 illustrates, fewer visual context errors were committed as higher grade levels were tested. Preschoolers committed 126 visual context errors; kindergarteners committed 87 errors and first graders committed 18 errors. The sharp reduction in the number of errors committed was an outstanding result of the visual context error analysis.

Table 3.9

THE ERRORS ON THE VISUAL CONTEXT TASK BY CHILDREN IN DIFFERENT GRADE LEVELS

| | Grade Levels[a] | | | | | |
|---|---|---|---|---|---|---|
| | Pre-school | | Kindergarten | | First Grade | |
| Error Types | # | % | # | % | # | % |
| Whole Sentence | 30 | 24 | 25 | 29 | 0 | 0 |
| Individual Letter | 24 | 19 | 15 | 17 | 11 | 61 |
| "a" omission | 7 | 6 | 4 | 5 | 7 | 39 |
| Division | 18 | 14 | 11 | 13 | 0 | 0 |
| Combination | 39 | 31 | 26 | 30 | 0 | 0 |
| Idiosyncratic | 8 | 6 | 6 | 7 | 0 | 0 |
| TOTAL | 126 | 100 | 87 | 101* | 18 | 100 |

[a] n=15

*The percent total does not equal 100 due to rounding errors.

An examination of the types of visual context errors committed by each grade level yielded differences between the first graders' errors as compared to the pre-schoolers' and kindergarteners' errors (Table 3.9). Only two first grade children committed errors and each child committed only one type of error. One child made only the individual letter error on all eleven test sentences, while the other child produced only the "a" omission errors. No other visual error types were committed by first graders. In contrast, pre-schoolers and kindergarteners committed every error type. The only difference between the pre-schoolers' errors and the kindergarteners' errors was the lower incidence of the kindergartener's errors.

In the current study the finding of grade level differences in the types of errors committed is not in line with the findings of the past research. Both Meltzer and Herse (1969) and Kingston, Weaver, and Figa (1972) found that first graders committed a range of error types. The difference in the findings can possibly be explained by the time of year in which the testing occurred. The current study tested the children at the end of the school year. The Meltzer and Herse (1969) study tested the first graders at the beginning of the school year. Thus, the first graders of the Meltzer and Herse study could be comparable to the kindergarteners of the current study. The kindergarteners of the current study did exhibit a range of error

types as did Meltzer and Herse's first graders. (Kingston, Weaver, and Figa, 1972, did not report when their study was conducted so no explanation for the difference can be given.)

The visual context errors classified as whole sentence and individual letter represented the number of sentences which were treated either as synonymous to a word or as containing as many words as letters. Given the eleven test sentences, if a child circled every sentence or circled every letter in every sentence, eleven errors were committed.

Six children committed the whole sentence error. In the pre-school grade level, the 30 whole sentence errors (24% of the total errors) were committed by three children. Two children circled every sentence and one child circled eight of the test sentences. In the kindergarten errors, the 25 whole sentence errors (29% of the total errors) were committed by three children also. Again, two children completely circled each sentence of the eleven test sentences and one child circled only three sentences. No first grader committed the whole sentence error. Thus, five children (three pre-schoolers, and two kindergarteners) committed the whole sentence error for the majority, if not all, of the eleven test sentences, while one kindergarten child only committed the error on a few sentences. The whole sentence errors accounted for 24% of the pre-schoolers' visual errors, and 29% of the kindergarteners' visual errors.

The fact that the whole sentence error was not reported

in past research can possibly be accounted for by the grade level of the children included in the studies. The past studies included only first graders, while the pre-schoolers and kindergarteners were the only children in the current study to commit the error. If the beginning first graders of the Meltzer and Herse (1969) study were comparable to the kindergarteners in the current study, then a whole sentence error should have been committed. Since none was reported, the comparability of the two groups can be doubted.

Clearly, the five children who committed the error on the majority of the test sentences operationally defined the direction of "circle each word" as circle the entire sentence. Apparently these young children had not differentiated between words within sentences and the whole sentence when presented with a segmentation task.

While the whole sentence error exhibited an undifferentiated view of a sentence, the individual letter error exhibited a minute dissection of a sentence. The individual letter error was reported by Meltzer and Herse (1969) as the initial stage in their hierarchy of errors. McNinch (1975) found that the low readiness group equated letters and words on his visual task.

In the current study, the individual letter error was committed by each grade level, although more pre-schoolers than kindergarteners or first graders committed the error (Table 3.9). Four pre-schoolers committed 24 individual

letter errors accounting for 19% of the pre-schoolers' total errors. Two pre-schoolers circled each letter in all eleven test sentences, and two pre-schoolers circled each letter in only one test sentence. One kindergartener circled each letter in the eleven test sentences, and one kindergartener circled each letter in four test sentences. The fifteen individual letter errors accounted for 17% of the kindergarteners' total errors. The one first grader who committed the individual letter error circled every letter in all eleven test sentences. Since the total number of first graders' errors was 18, the eleven individual letter errors accounted for 61% of the total errors. Thus, four children (two pre-schoolers, one kindergartener, and one first grader) committed the individual letter error exclusively, while three children (two pre-schoolers, and one kindergartener) only committed the error on a few sentences.

The fact that more pre-schoolers committed the individual letter error than kindergarteners or first graders indicates that the individual letter error may be an initial error stage (Meltzer and Herse, 1969). But the whole sentence error was also committed by more pre-schoolers or kindergarteners than first graders. Conceptually, both the individual letter error and the whole sentence error represent two extreme definitions for the boundaries of a word in the visual context. Thus, in the current study both the whole sentence error and the individual letter would be

classified as initial definitions for the boundaries of a word in the visual context.

The "a" omission error had a possible score of seven errors if every word "a" was not circled by the child. The seven errors in the first grade were committed by one child who did not circle any word "a" in the test sentences. The four errors in the kindergarten column were committed by one child also. The seven errors listed in the pre-school column were committed by three pre-schoolers -- one child omitted four "a" words, another omitted two, and the third omitted only one. As reported in Table 3.9, the "a" omission errors accounted for 39% of the first grade errors (18 total errors), five percent of the kindergarten errors (81 total errors) and six percent of the pre-school errors (126 total errors).

The "a" omission error was not reported in the past research. The children in the current study had completed a definition task, and a recognition task involving the terms word, letter, and sentence, before the presentation of the segmentation task. Thus, the "a" omission error could have been a result of cues in the previous tasks. The error clearly reflects the dual categorization for "a".

Fewer division and combination errors were committed as higher grade levels were tested (Table 3.9). No first graders committed either division errors or combination errors. The division error was committed 18 times by pre-

schoolers (14% of their total errors) and 11 times by kindergarteners (13% of their total errors). The combination error was committed 39 times by pre-schoolers (31% of their total errors) and 26 times by kindergarteners (30% of their total errors). Thus, the combination error was exhibited more frequently than the division error.

The commission of combination and division errors by the children in the current study concurs with the results of Meltzer and Herse (1969) and Kingston, Weaver, and Figa (1972). Kingston, Weaver and Figa (1972) found that the combination error was the most common error type, and this study's findings agree. But the current study does not concur with the past research on the grade level of the children who committed the errors. Studying only first graders, the previous studies found that first graders committed division and combination errors, while the current study found that no first graders and only pre-schoolers and kindergarteners committed the errors. If the beginning first graders of the Meltzer and Herse (1969) study were comparable to the graduating kindergarteners of the current study, the discrepancy could possibly be resolved.

After tabulating the incidence of division and combination errors, the two types of errors were analyzed to determine if a common criterion formed the basis for a decision to divide a word or to combine two words. Since Meltzer and Herse (1969) found that ascending letters were used as a cue to word boundary, the errors were analyzed to determine

whether the division coincided with either an ascending letter (t) or a descending letter (p). If a child consistently divided words at an ascending or descending letter, 21 divisions could be made within the words of the test sentences. One kindergartener committed a total of five errors -- all division errors at ascending or descending letters. No other child committed only division errors. Of the 18 division errors committed by pre-schoolers, 17 errors occurred at ascending or descending letters. Of the eleven division errors committed by kindergarteners, ten occurred at ascending and descending letters. Thus, when division errors occurred, the criterion may have been the presence of an ascending or descending letter.

Since Meltzer and Herse (1969) had found that the number of letters was a dominant cue, and Downing (1969-70, 1970, 1971-72) had found length to be an important cue in his interviews, the combination and division errors were analyzed to determine whether an arbitrary length was used as a cue. As presented in Table 3.10, the means and standard deviations computed for the number of letters included in a circle were similar for both the pre-schoolers' and the kindergarteners' circles. Thus, both groups seemed to

be using an arbitrary length of four to five letters. Furthermore, if the arbitrary length of three, four or five letters was used, then 53 circles or 67 percent of the circles made by pre-schoolers and 33 circles or 61 percent of the circles made by kindergarteners could be included. Thus, when the children committed combination or division errors, their performances seemed to be influenced by an arbitrary length of three, four, or five letters.

Table 3.10

THE NUMBER OF LETTERS CONTAINED WITHIN A CIRCLE EXHIBITING A COMBINATION OR DIVISION ERROR

| | Grade Level[a] | |
|---|---|---|
| | Pre-school | Kindergarten |
| Total Number of Circles | 79 | 54 |
| Range of Letters Included | 1-12 | 1-11 |
| Md | 4 | 4 |
| M | 4.6 | 4.8 |
| SD | 4.11 | 5.68 |

[a] n=15

When a hierarchial progression of errors (Meltzer and Herse, 1969) was considered, a logical representation of a hierarchy would include the whole sentence error and the individual letters error in the initial stage, since these errors have two extreme definitions for the boundaries of

a word in the visual context. The second stage would consist of the combination and division errors, since these errors dissected the sentences into word boundaries using an arbitrary length cue or a configuration cue. But this logical progression of errors was not confirmed operationally. Considering the incidence of errors, if a progression existed, then the first graders would commit the fewest number of errors. The study concurred that the fewest number of errors were committed by first graders. But in addition, if a progression existed, then the first graders would not commit an initial stage error and yet may commit a second stage error. But a first grader committed the individual letter error of the initial stage and no first grader committed any combination or division errors of the second stage. Thus, the current study supported the findings of no hierarchical progression of errors (Kingston, Weaver, and Figa, 1972), and did not support the progression stated by Meltzer and Herse (1969).

In summary, the following results can be reported from the analysis of the performance errors with the visual context:

1. Fewer visual context errors were committed as higher grade levels were tested.
2. Five types of visual context errors were committed: whole sentence errors, individual letter errors, "a" omission errors, division errors, and combination errors.

3. Fewer types of visual context errors were committed by first graders than by kindergarteners or pre-schoolers.

4. In the first grade group, only two types of errors were committed. One child committed only "a" omission errors and another child committed only individual letter errors.

5. Kindergarteners and pre-schoolers committed every type of visual context error. The descending order of frequency was combination errors, whole sentence errors, individual letter errors, division errors, "a" omission errors, and idiosyncratic errors.

6. Since the majority of division errors occurred at ascending (t) or descending (p) letters, the configuration of the letter may have been a criterion indicating word boundary.

7. In an analysis of both division and combination errors, the majority of errors contained three, four or five letters indicating that an arbitrary length may have been a criterion for word boundary.

Aural context errors. When the aural context segmentation performances were analyzed for systematic error patterns, the children's intonation patterns did not resemble the natural stress patterns which were recorded on the tapes. The children's intonation patterns sounded flatter with less noticeable variation between stresses. Moreover, when a child knocked for each word, each word received some stress. For example, determiners, which do not receive stress in natural speech, received some stress during the aural segmentation task. The task of delineating words by knocking appeared to require the simultaneous occurrence of the knock and the stress resulting in a flatter intonation pattern with more frequent stress marks than in

natural speech.

Therefore, the category of stress error was defined as the simultaneous occurrence of a vocal stress mark and a knock given by a child to a syllable, a phrase, or a sentence. Examples of the stress errors committed in the aural context task are given below. The single quotation mark (') indicates the placement of the stress and the knock.

1. Phrase stress errors: The happy children, is funny, throws a ball, for me, A dog, Tell me, The gray.
2. Whole sentence stress errors: Help Daddy. Ted is lost. Tell me a fairy tale.
3. Syllable stress errors: surprise, birthday, Sally, Mommy, picture, kitten.

Occasionally exceptions did occur. One exception was the occurrence of two stress marks and one knock. Examples of the two stress exceptions are listed below. The single quotation mark indicates where the stress marks occurred.

1. Phrase two-stress errors: happy children, a pretty picture.
2. Sentence two-stress errors: A dog barked.

The opposite exception, a knock without any vocal stress mark, were the perseveration errors. The child had completed the vocal response but gave one additional knock.

As exhibited in Table 3.11, pre-schoolers or kindergarteners exhibited more stress errors with the aural context than first graders. Pre-schoolers committed 180 stress errors or 96% of their total aural context errors. Kinder-

garteners committed 180 stress errors or 95% of their total aural context errors. First graders committed 66 stress errors or 97% of their total aural context errors. Thus, although the number of errors decreased as children in higher grade levels were tested, the stress error accounted for nearly all of the aural context errors committed by all of the children.

Table 3.11

THE STRESS ERRORS ON THE AURAL CONTEXT TASK

| Errors | Grade Levels[a] | | |
|---|---|---|---|
| | Pre-school | Kindergarten | First Grade |
| Stress | | | |
| Phrase | 130 | 135 | 24 |
| Sentence | 5 | 1 | 0 |
| Syllable | 45 | 44 | 42 |
| TOTAL | 180 | 180 | 66 |
| Exceptions | | | |
| Two-Stress | 1 | 4 | 1 |
| Perseveration | 5 | 5 | 1 |
| TOTAL | 6 | 9 | 2 |
| GRAND TOTAL | 186 | 189 | 68 |
| Percent of Errors Accounted for by Stress Error | 96 | 95 | 97 |

[a] n=15

The children in different grade levels exhibited different types of stress errors (Table 3.11). The pre-schoolers and the kindergarteners committed most of their stress errors

on phrases. Pre-schoolers gave 130 phrases (70% of their total errors) one stress mark and one knock. Kindergarteners gave 135 phrases (71% of their total errors) one stress and one knock. In contrast, the first graders gave 24 phrases (35% of their total errors) one stress and one knock.

First graders committed the majority of their stress errors on syllables, while pre-schoolers' and kindergarteners' second frequent stress error was syllables. First graders syllabicated 42 words (62% of their total errors) giving each syllable one stress and one knock. Kindergarteners syllabicated 44 words (23% of their total errors) and pre-schoolers syllabicated 45 words (24% of their total errors). The syllable stress error was the only error which did not numerically decrease as higher grade levels were tested.

The whole sentence error (one knock for an entire sentence) was committed infrequently on the aural context task. When the whole sentence received one stress mark and one knock, the error was classified as a stress error. Pre-schoolers committed five stress errors on sentences, while one kindergartener committed one stress error on a sentence. No first graders committed the whole sentence stress error.

Exceptions to the stress error did occur (Table 3.11). Kindergarteners demonstrated the highest number of exceptions (n=9). Pre-schoolers were second with six exceptions. First graders committed only two exceptions. Two types of excep-

tions occurred. One exception was two stress marks and one knock which was made on phrases and sentences. The one pre-schooler's two-stress error was on a sentence. The four kindergarteners' two-stress errors and the one first grader's two-stress error were committed on phrases. The second exception to the stress error was the perseveration error. The child had completed the vocal response but gave one additional knock. Kindergarteners and pre-schoolers each committed five perseveration errors, while a first grader committed only one.

In summary, the stress error category accounted for 96% of the pre-schoolers' aural context errors, 95% of the kindergarteners' aural context errors, and 97% of the first graders' aural context errors. Pre-schoolers or kindergarteners committed more stress errors than first graders. Pre-schoolers or kindergarteners committed the majority of their stress errors on phrases, while first graders committed the majority of their stress errors on syllables. The syllable stress error was the only error which did not numerically decrease as higher grade levels were tested. The two-stress error and the perseveration error were the two types of exceptions to the stress error. The two-stress error was committed more by kindergarteners than by pre-schoolers or first graders. The perseveration error was committed more by pre-schoolers or kindergarteners than by first graders.

The conclusion reported in past aural context research

(Karpova, 1955, and Holden, 1972) that older children were able to differentiate the components of a sentence better than the younger children was supported in the current study. First graders committed fewer aural context errors than the pre-schoolers or kindergarteners.

The past research did not analyze the errors of the aural context in terms of the intonation pattern used by the child as he completed the task. McNinch (1974) stated that the utterances used for the aural task contained different intonation and juncture patterns but McNinch did not report any analysis of the children's performance beyond the total score. Thus, the use of the stress error in the current study is a different approach for analyzing children's errors on the aural context task.

The overlapping systems inherent in language allow for other explanations for the aural context errors in addition to the intonation pattern explanation. From a syntactic-semantic viewpoint, the errors could be categorized as major constituents of the sentence. Karpova (1955) identified the second stage in sentence differentiation as the separation of the subject and predicate of a sentence. Thus, the category of major constituent errors was defined as one knock for an entire phrase. Examples of the major constituents which received one knock are listed below.

1. Determiner + noun (Det + N):
   a ball, A dog, a kitten.

2. Determiner + adjective + noun (Det + Adj + N):
   The happy children, a pretty picture.

3. Adjective + noun (Adj + N):
   fairy tale.

4. Indirect object (IO):
   for me.

5. Noun phrase + noun phrase (NP + NP):
   me a kitten, picture for me.

6. Verb phrase (VP):
   is funny, are skipping, throws a ball.

7. Verb + indirect object (V + IO):
   Tell me, asked me.

8. Noun + verb (N + V):
   Tom drew, Ted is.

9. Noun + verb + indirect object (N + V + IO):
   Mommy gave me.

The table of the major constituent errors (Table 3.12) depicts the similarity between the pre-schoolers' and the kindergarteners' errors. First, the totals for the number of major constituent errors were similar. Pre-schoolers committed 92 major constituent errors and kindergarteners committed 97. Second, children in both grade levels committed every major constituent error except two. Pre-schoolers did not have an Adj + N error or a N + V + IO error. Kindergarteners did not have an IO error or a N + V error. Third, the majority of the pre-schoolers' and kindergarteners' errors were on noun phrase constituents. Pre-schoolers committed 62 noun phrase errors (67% of their major constituent errors) and kindergarteners committed 56 errors (61% of their major constituent errors). And fourth, the percen-

Table 3.12

THE MAJOR CONSTITUENT ERRORS ON THE AURAL CONTEXT TASK

| Major Constituent Errors | Grade Levels[a] | | |
|---|---|---|---|
| | Pre-school | Kindergarten | First Grade |
| NP (total) | 62 | 56 | 18 |
| Det + N | 51 | 44 | 14 |
| Det + Adj + N | 8 | 11 | 0 |
| Adj + N | 0 | 1 | 4 |
| IO | 4 | 0 | 0 |
| NP + NP | 1 | 1 | 0 |
| VP | 15 | 16 | 2 |
| V + IO | 10 | 0 | 0 |
| N + V | 4 | 0 | 0 |
| N + V + IO | 0 | 1 | 0 |
| TOTAL MAJOR CONSTITUENT ERRORS | 92 | 97 | 20 |
| GRAND TOTAL OF ERRORS | 186 | 189 | 68 |
| PERCENT OF ERRORS ACCOUNTED BY CATEGORY | 49% | 51% | 29% |

[a] n=15

tages for number of the errors explained by the major constituent category were similar for the two grade levels. Forty-nine percent of the pre-schoolers' errors and 51% of the kindergarteners' errors were accounted for by the major constituent category.

In contrast, the first graders' major constituent errors formed a different pattern. The first graders committed only 20 major constituent errors. The range of errors committed contained only three error types. Eighteen of the first graders' errors were two noun phrase errors. The noun phrase Det + N received 14 errors and the noun phrase Adj + N received four errors. The third error type was the V + IO which received two errors. The major constituent error category accounted for 29% of the first graders' errors.

Thus, the primary result was that first graders committed fewer major constituent errors on the aural context task than kindergarteners or pre-schoolers. The result is in accord with the conclusions of Karpova (1955) and Holden (1972) that older children differentiated words in sentences better than younger children. A second result was that the majority of errors for each grade level involved a noun phrase constituent. First graders continued to commit the Det + N error but did not commit most of the other major constituent errors.

Although the major constituent category accounted for 49% of the pre-schoolers' errors, 51% of the kindergarteners' errors and 29% of the first graders' errors, the category did not account for as many aural context errors as the stress error category. Yet, due to the overlapping of the intonation system and the syntactic-semantic systems of language, either error analysis could contribute to the

explanation of the aural context errors.

The error analyses by Holden and MacGinitie (1972) and by Ehri (1975) found that functors were ignored. Karpova (1955) identified the third stage of sentence differentiation as the isolation of all words except prepositions and conjunctions. In the current study, the stress error category contained errors where functors did not receive a separate stress or knock. Also, the major constituent category contained Det + N phrases in which the functor was ignored. The apparent prevalence of the error warranted the creation of the functor inclusion category.

The category of functor inclusion was defined as one knock for a determiner and a neighboring word. Examples of the functor inclusion errors which were committed are below.

1. Det + Adj: a pretty, The gray, a fairy.
2. Det + N: a question, My surprise.
3. V + Det: drew a, is a.

For the functor inclusion category, the pre-schoolers' and the kindergarteners' errors exhibited a similar error pattern (Table 3.13). First, the totals for number of functor inclusion errors were similar for both grade levels. Pre-schoolers committed 89 errors and kindergarteners 85. Second, the number of errors ranged from the most numerous of the Det + N (51 by pre-schoolers and 44 by kindergarteners) to Det + Adj (34 by pre-schoolers and 30 by kindergarteners) to the least numerous of the V + Det errors (four

Table 3.13

THE FUNCTOR INCLUSION ERRORS ON THE AURAL CONTEXT TASK

| Functor Inclusion Errors | Grade Levels[a] | | |
|---|---|---|---|
| | Pre-school | Kindergarten | First Grade |
| Det + Adj | 34 | 30 | 2 |
| Det + N | 51 | 44 | 14 |
| V + Det | 4 | 11 | 3 |
| TOTAL FUNCTOR INCLUSION ERRORS | 89 | 85 | 19 |
| GRAND TOTAL OF ERRORS | 186 | 189 | 68 |
| PERCENTAGE OF ERRORS ACCOUNTED FOR BY THE CATEGORY | 48% | 45% | 28% |

[a] n=15

by pre-schoolers and eleven by kindergarteners). Third, the functor inclusion error category accounted for 48% of the pre-schoolers' total errors and 45% of the kindergarteners' total errors.

In contrast, the total number of functor inclusion errors committed by first graders was 19 errors (Table 3.13). The Det + N was the most common error for the first graders as it was for the other two grade levels. But the other two positions were reversed. Three V + Det errors and two Det + Adj errors were made by first graders. The functor inclu-

sion category accounted for 28% of the first graders' errors.

Thus, the primary result was that the first graders committed fewer functor inclusion errors than the pre-schoolers or kindergarteners. Secondly, although children in every grade level committed all three functor inclusion errors, the Det + N error was the most common error for all children. First graders continued to commit the Det + N functor inclusion error more often than the other functor inclusion errors. Since Karpova (1955) Holden and MacGinitie (1972), and Ehri (1975) also found that seven year olds, kindergarteners, and first graders, respectively, continued to commit functor inclusion errors, the current study supported their results.

The functor inclusion category, accounting for 48% of the pre-schoolers' errors, 45% of the kindergarteners' errors and 28% of the first graders' errors, explained a similar percentage of the aural context errors as the major constituent category. The Det + N error was common to both categories and was the most frequent error. Thus, the similar percentages were a result of the common Det + N error. Since all the functor inclusion errors could also be accounted for by the stress error category, the stress error category was the more inclusive explanation of the aural context errors.

Therefore, the analysis of the aural context errors

can be summarized as follows:

1. The stress error classification scheme accounting for nearly all of the aural context errors committed, was the most inclusive explanation of aural context errors, when compared with the major constituent error classification scheme and the functor inclusion error classification scheme.

2. First graders committed fewer stress errors, major constituent errors, and functor inclusion errors than pre-schoolers or kindergarteners.

3. Pre-schoolers' or kindergarteners' stress errors occurred most often on phrases, while first graders' stress errors occurred most often on syllables.

4. The syllable stress error was the only stress error which did not numerically decrease as higher grade levels were tested.

5. The majority of major constituent errors involved a noun phrase constituent and Det + N was the most common error.

6. Although every grade level committed all three functor inclusion errors, the Det + N functor inclusion error was the most common error.

Task variables. The composition of the utterances used in the segmentation task inherently involved variables which could have influenced the children's performances. The past research had not systematically varied the composition of the utterances so that statements regarding the variables of sentence type or sentence length could not be made. Therefore, the decision was to vary sentence type and sentence length in the current study. The children's performances were examined to determine whether the type or length of the sentences influenced their performances. The performance errors were also analyzed to determine whether

more errors occurred at the beginning, middle, or end of the sentences. The analyses of the children's performances in regard to the three task variables of sentence type, sentence length, and position within sentence are reported below.

Holden and McGinitie (1972) reported that sentence type was varied in their aural and visual segmentation tasks but the sentences were continually revised as the tasks were presented. As a consequence, no conclusions regarding sentence type were stated. No other research considered the variable of sentence type. Therefore, different types of sentences were selected for the segmentation task to determine whether sentence type would influence the children's performances. The five types included were (1) subject-verb (SV); (2) subject-verb-complement (SVC); (3) subject-verb-object (SVO); (4) subject-verb-object-object (SVOO); (5) Command (C). Two sentences were included for each sentence type except the SVOO for which three sentences were included. In Table 3.14 the errors for each sentence type on the visual context of the segmentation task are presented.

Table 3.14

TOTAL NUMBER OF VISUAL CONTEXT ERRORS ON FIVE SENTENCE TYPES

| Sentence Types | Grade Levels[a] Pre-school # | % | Kindergarten # | % | First Grade # | % |
|---|---|---|---|---|---|---|
| SV | 25 | 20 | 16 | 18 | 3 | 17 |
| SVC | 28 | 22 | 21 | 24 | 3 | 17 |
| SVO | 18 | 14 | 15 | 17 | 3 | 17 |
| SVOO | 37 | 29 | 23 | 26 | 6 | 33 |
| C | 18 | 14 | 12 | 14 | 3 | 17 |
| TOTAL | 126 | 99* | 87 | 99* | 18 | 101* |

[a] n=15

*Total percents do not equal 100 due to rounding errors.

Within each grade level, the percentages of visual errors were reasonably consistent across the sentence types. The range between the high and low extremes was similar for each grade level -- the pre-schoolers' range was 15 points; the kindergarteners' range was 12 points; and the first graders' was 16 points. The pre-schoolers' visual error percentages ranged from a low of 14% on both the Command and the SVO sentences to a high of 29% on the three SVOO sentences. The kindergarteners' visual error percentages ranged from a low of 14% on the Command sentences to a high of 26% on the three SVOO sentences. The first graders' visual error percentages ranged from a low of 17% on the Command,

SV, SVO and SVC sentences to a high of 33% on the three SVOO sentences.

Within each sentence type, the percentages of visual errors were similar for all the grade levels (Table 3.14). The error percentages for the Command and SVO sentences were the lowest for all the grade levels. The error percentages of the SV and the SVC sentences were intermediate. And the error percentages for the three SVOO sentences were the highest for all three grade levels. The high percentage for the SVOO sentence type can be at least partially explained by the inclusion of three sentences for the SVOO sentence type. The other sentence types had only two sentences included and so fewer opportunities for error were presented. Thus, the SVOO sentences should have incurred more errors and they did.

In summary, the analysis of the visual context errors found that the order of difficulty among the five sentence types was (1) Command and SVO -- easiest; (2) SV and SVC -- intermediate difficulty; (3) SVOO -- most difficult. But even though an order of difficulty did occur, the range between the easiest and the most difficult sentences was small. The percentage of visual errors were reasonably similar for every sentence type. Thus, sentence type did not seem to strongly influence the children's performance with the visual context of the segmentation task.

In Table 3.15 the number and percentages of aural

context errors committed by the children in each grade level are presented. The kindergarteners' and pre-schoolers' error percentages on the aural context were similar to their error percentages on the visual context. The first graders' error percentages on the aural context varied on two sentence types from their visual context error percentages.

Table 3.15

TOTAL NUMBER OF AURAL CONTEXT ERRORS ON FIVE SENTENCE TYPES

| Sentence Types | Grade Levels[a] Pre-school # | % | Kindergarten # | % | First Grade # | % |
|---|---|---|---|---|---|---|
| SV | 35 | 19 | 38 | 20 | 12 | 18 |
| SVC | 49 | 26 | 50 | 26 | 15 | 22 |
| SVO | 24 | 13 | 22 | 12 | 4 | 6 |
| SVOO | 56 | 30 | 57 | 30 | 28 | 41 |
| C | 22 | 12 | 22 | 12 | 9 | 13 |
| TOTAL | 186 | 100 | 189 | 100 | 68 | 100 |

[a] n=15

Within the kindergarten and pre-school grade levels, the percentages of aural errors did not differ greatly across the five types of sentences (Table 3.15). Eighteen percentage points constituted the range of difference among the sentence types. Pre-schoolers' error percentages ranged from a low of 12% of Command sentences to a high of 30% on

the three SVOO sentences. The kindergarteners' percentages ranged from a low of 12% on both the Command sentences and the SVO sentences to a high of 30% on the three SVOO sentences. Thus, the percentages of the aural errors for each sentence type were generally consistent for the kindergarten and pre-school levels, although a range did occur.

Within the first grade level, the percentages of aural errors for the five sentence types did not present the relatively compact cluster of percentages that the kindergarteners' and pre-schoolers' percentages did (Table 3.15). The first graders' error percentages ranged 38 points from a low of 6% on the SVO sentences, to a high of 41% on the three SVOO sentences. Although the spread of 38 percentage points between the extremes was greater, the intermediate percentages were similar to the percentages of the other grade levels. Thus, the percentages of aural errors committed by first graders were similar for three sentence types (Command, SV, and SVC) but the percentage of errors on the SVO sentences was very low and the percentage of errors on the three SVOO sentences was very high.

Within each sentence type, the error percentages for the pre-schoolers and kindergarteners were very similar (Table 3.15). Except for the two extremes (which did not alter the order of difficulty), the first graders' error percentages were similar to the other grade levels'. Consequently, the error percentages on the Command sentences

and the SVO sentences were the lowest for all grade levels. The error percentages on the SV sentences and the SVC sentences were intermediate. And the error percentages for the three SVOO sentences were the highest for all grade levels. The consistently high percentages for the SVOO sentences can be partially explained by the inclusion of three sentences for the SVOO type, while the other sentence types had only two sentences. Thus, the order of difficulty among the five sentence types on the aural context was the same order as on the visual context: (1) Command and SVO -- easiest; (2) SV and SVC -- intermediate difficulty; (3) SVOO -- most difficult.

In summary, a small range among the error percentage for the different sentences did occur with both contexts. The order of difficulty for the five sentence types was (1) Command and SVO -- easiest; (2) SV and SVC -- intermediate difficulty; (3) SVOO -- most difficult. Since the average range among the error percentages was only 16 points for all grade levels with the visual context and for two grade levels with the aural context, the children's performances did not seem to have been influenced greatly by the type of sentence. The exception was the first graders' very high and very low percentages for the SVOO and SVO sentences on the aural context. Their percentages for the intermediate sentences were similar to the percentages of the other grade levels. Thus, although an order of difficulty did occur, one sentence type

was not substantially more easy or more difficult than another on the aural context or the visual context of the segmentation task.

The above discussion of sentence types ignored the confounding factor of sentence length. For example, Command sentences are usually shorter than SVOO sentences. Consequently, for each sentence type a "long" sentence and a "short" sentence was included in the task. In Table 3.16 the sentence lengths and the respective number of aural context errors committed by each grade level are presented.

Table 3.16

THE INCIDENCE OF AURAL CONTEXT ERRORS ON DIFFERENT SENTENCE LENGTHS

| Sentences | Grade Levels[a] | | |
|---|---|---|---|
| | Pre-school | Kindergarten | First Grade |
| Commands | | | |
| Long -- 5 words | 16 | 18 | 8 |
| Short -- 2 words | 6 | 4 | 1 |
| SVO | | | |
| Long -- 4 words | 15 | 15 | 4 |
| Short -- 3 words | 9 | 7 | 0 |
| SV | | | |
| Long -- 5 words | 19 | 22 | 8 |
| Short -- 3 words | 16 | 16 | 4 |
| SVC | | | |
| Long -- 6 words | 24 | 25 | 12 |
| Short -- 5 words | 25 | 25 | 3 |
| SVOO | | | |
| Long -- 7 words | 19 | 16 | 6 |
| Short -- 5 words | 27 & 15 | 22 & 18 | 10 & 12 |

[a] n=15

Generally, the shorter sentence for each type had fewer incidences of aural errors. On the shorter Command, SVO, and SV sentences the children had performed with fewer errors. But with the two SVC sentences, an equal number of kindergarteners' errors and more pre-schoolers' errors were committed. Also, the SVOO type consisted of two shorter sentences on which a higher incidence of errors had occurred than on the longer SVOO sentence. Thus, the incidence of errors did not present a uniform pattern of fewer errors on the shorter sentences. But, since fewer errors were usually committed on shorter sentences, the length factor did partially influence the children's performances on the aural context of the segmentation task.

In Table 3.17, the sentence length and the respective number of visual context errors committed by the children in each grade level were presented. Generally, the shorter sentences for each type had fewer incidences of visual context errors. Three exceptions did occur. First graders committed more errors on the shorter SV sentence than the longer SV sentence. The kindergarteners' performances with the two SV sentences and the first graders' performances with the three SVOO sentences resulted in an equal number of errors regardless of sentence length. Thus, the length of the sentence on the visual context of the segmentation task did seem to influence the children's performance but the pattern was not consistent.

Table 3.17

THE INCIDENCE OF VISUAL CONTEXT ERRORS ON DIFFERENT SENTENCE LENGTHS

| Sentences | Grade Levels[a] | | |
|---|---|---|---|
| | Pre-school | Kindergarten | First Grade |
| Commands | | | |
| Long -- 5 words | 13 | 7 | 2 |
| Short -- 2 words | 5 | 5 | 1 |
| SVO | | | |
| Long -- 4 words | 12 | 10 | 2 |
| Short -- 3 words | 6 | 5 | 1 |
| SV | | | |
| Long -- 5 words | 16 | 8 | 1 |
| Short -- 3 words | 9 | 8 | 2 |
| SVC | | | |
| Long -- 6 words | 16 | 11 | 2 |
| Short -- 5 words | 12 | 10 | 1 |
| SVOO | | | |
| Long -- 7 words | 14 | 10 | 2 |
| Short -- 5 words | 10 & 13 | 6 & 7 | 2 & 2 |

[a] n=15

In summary, the factor of length seemed to have influenced the children's performances with both the aural and the visual segmentation task.

The influence of length on the aural context support the similar finding by Figa (1972). But Figa did not mention any influence of length on the visual context of his segmentation task. The increased memory load may be the causitive factor for the influence of length on the aural context task, but memory was not involved in the visual context.

The influence of length in the visual context (and perhaps in the aural context too) may be the simple fact of providing more chance for error.

The confounding of length and sentence type was specifically addressed by the inclusion of four types of sentences which were all composed of five words. In Table 3.18 the incidence of aural context errors on the five-word sentences are presented.

Table 3.18

THE INCIDENCE OF AURAL CONTEXT ERRORS ON DIFFERENT TYPES OF SENTENCES OF EQUAL LENGTH

| | Grade Levels[a] | | |
|---|---|---|---|
| Five Word Sentences | Pre-school | Kindergarten | First Grade |
| Command | 16 | 18 | 8 |
| SV | 19 | 22 | 8 |
| SVC | 25 | 25 | 3 |
| SVOO | 27<br>15 | 23<br>18 | 10<br>12 |

[a] n=15

Within each grade level, the range between the highest incidence of aural context errors and the lowest was not great. The range between the pre-schoolers' high and low incidences of aural context errors was 12 errors. The highest and the lowest incidences of error were both committed with the SVOO five-word sentences -- 27 errors and 15

errors. The pre-schoolers committed 16 errors with the five-word Command sentence, 19 errors with the SV sentence and 25 errors with the SVC sentence. Since both the high and low extremes of errors occurred with the same sentence type, and since the range of the errors was small, sentence type did not seem to have influenced the pre-schoolers' performance with the aural context.

The range between the kindergarteners' high and low incidences of aural context errors was only 7 errors. The highest incidence -- 25 errors -- occurred with the SVC sentence. The lowest -- 18 errors -- was with the Command sentence and with one of the SVOO sentences. The kindergarteners committed 22 errors with the SV five-word sentence, and 23 with the other five-word SVOO sentence. Since the range of the errors was small, sentence type did not seem to have influenced the kindergarteners' performance on the aural context segmentation task.

The range between the high and low incidences of the first graders' aural errors was only nine errors. The highest incidence of error was 12 errors with one of the SVOO sentences. The lowest -- three errors -- was committed with the SVC sentence. The first graders committed eight errors with the Command and the SV sentences, and 10 errors with the other SVOO sentence. Since the range of the errors was small, the first graders' performance with the aural context did not seem to have been influenced by sentence

type.

Thus, when length was held constant, the incidences of aural errors within a grade level was similar for every type of sentence. Although a small range did occur when the sentence length was equal, the sentence type did not seem to have influenced the children's performance with the aural context of the segmentation task.

Within each grade level the range between the highest and the lowest incidence of visual context errors was not great (Table 3.19). The range between the pre-schoolers' high and low incidence of errors was only six errors. The highest incidence of visual context errors was committed with the SV and the SVC sentences -- 16 errors. The lowest -- 10 errors -- was committed with one SVOO sentence. The Command and the other SVOO sentence both received 13 errors. Because the range was small, the pre-schoolers' performances with the visual context did not seem to have been influenced by sentence type.

The range between the kindergarteners' highest and lowest incidence of visual context errors was only five errors. The highest incidence -- 11 errors -- was committed with the SVC sentence. Six errors were committed with a SVOO sentence for the lowest incidence of error. The Command sentence and the other SVOO sentence both received seven errors and the SV sentence received eight errors. Thus, the kindergarteners' performance with the visual context

Table 3.19

THE INCIDENCE OF VISUAL CONTEXT ERRORS ON DIFFERENT TYPES OF SENTENCES OF EQUAL LENGTH

| Five Word Sentences | Grade Levels[a] | | |
|---|---|---|---|
| | Pre-school | Kindergarten | First Grade |
| Command | 13 | 7 | 2 |
| SV | 16 | 8 | 1 |
| SVC | 16 | 11 | 2 |
| SVOO | 10 | 6 | 2 |
| | 13 | 7 | 2 |

[a] n=15

did not seem to have been influenced by sentence type.

The first graders' performance with the visual context was also not influenced by sentence type. The range between the first graders' visual context errors was one error. With the Command, SVC, and both SVOO sentences, two errors were committed and with the SV sentence, one error was committed.

Thus, when sentence length was held constant, the type of sentence did not seem to have influenced the children's performances with the visual context or aural context of the segmentation task. The differences in their performances seemed to have been influenced by the length of the sentence and not the type of the sentence.

Related to the length factor is the position in the sentence factor. Did the children commit more errors in the

beginning of the sentence, the end, or the middle? In examining the position factor, the whole sentence errors and the individual letters errors were not considered because both errors involved the uniform treatment of an entire sentence. The remaining errors were classified as occurring in the beginning, middle, or end of a sentence according to the following criteria. The beginning of a sentence was defined as the first word or two words in the sentence. The end position was defined as the last word or two words in the sentence. The middle position was dependent upon the length of the sentence. The middle position was defined as the remaining words in the sentence which generally consisted of the second through the fifth words or any combination thereof.

Nearly half of the children's aural context errors were committed at the end of the sentences (Table 3.20). Forty-eight percent of the pre-schoolers' errors, 52% of the kindergarteners' errors, and 62% of the first graders' errors were committed at the end of the sentence. Since the aural context segmentation task required memory, the occurrence of more errors at the end of the sentence is logical.

The second highest percentage of aural context errors occurred at the beginning position. Twenty-eight percent of the pre-schoolers' errors, 26% of the kindergarteners' errors, and 22% of the first graders' errors were committed at the beginning of the sentence. According to serial learning research, the beginning position should have re-

ceived the fewest errors. Since the middle position was eliminated in 3 sentences, the beginning position presented more opportunities for error than the middle position and so more errors occurred at the beginning position.

Table 3.20

THE POSITION OF AURAL CONTEXT ERRORS IN THE SENTENCES

| Position | Grade Levels[a] Pre-school # | % | Kindergarten # | % | First Grade # | % |
|---|---|---|---|---|---|---|
| Beginning | 52 | 28 | 50 | 26 | 15 | 22 |
| Middle | 35 | 19 | 33 | 17 | 12 | 18 |
| End | 90 | 48 | 99 | 52 | 42 | 62 |

[a] n=15

The middle position received the lowest percentage of aural context errors. Nineteen percent of the pre-schoolers' errors, 17% of the kindergarteners' errors and 18% of the first graders' errors were committed at the middle position. The lower percentage of the middle position could be accounted for by the elimination of four sentences from the middle position category. Three sentences were considered too short to contain a middle portion ("A dog barked." "Help Daddy." "Ted is lost."). One sentence seemed to divide structurally into two parts -- "Tell me/a fairy tale." -- although the "me a" error could be considered in the middle position.

Since only seven sentences were categorized for the middle position, the low incidence of error can be accounted for by the reduced chance to commit an error.

Thus, in descending order, the end position, the beginning position, and the middle position received the highest percentage of aural context errors. The position factor did influence performances with the aural context segmentation task.

As presented in Table 3.21, the highest percentage of visual errors was at the end of the sentence. Twenty-one percent of the pre-schoolers' errors, 24% of the kindergarteners' errors, and 22% of the first graders' errors occurred at the end of the sentence. The second highest percentage of visual errors occurred at the middle of the sentence. The pre-schoolers committed the same percentage of errors in the middle as they did at the end of the sentence -- 21%. Kindergarteners committed 15% of their errors in the middle of the sentence. First graders committed 11% of their errors in the middle. The lowest percentage of errors occurred at the beginning of the sentence. Eleven percent of the pre-schoolers' errors, 10% of the kindergarteners' errors, and 5% of the first graders' errors were committed at the beginning of the sentence. Thus, in descending order, the highest percentage of errors on the visual context segmentation task occurred at the end position, the middle posi[illegible] and the beginning position.

Table 3.21

THE POSITION OF VISUAL CONTEXT ERRORS IN THE SENTENCES

| Position | Grade Levels[a] | | | | | |
|---|---|---|---|---|---|---|
| | Pre-school | | Kindergarten | | First Grade | |
| | # | % | # | % | # | % |
| Beginning | 14 | 11 | 9 | 10 | 1 | 5 |
| Middle | 26 | 21 | 13 | 15 | 2 | 11 |
| End | 26 | 21 | 21 | 24 | 4 | 22 |

[a] n=15

The highest percentage of errors on both the aural and the visual segmentation tasks occurred at the end position, but the remaining order was different with the two contexts. Therefore, position did seem to have influenced performances with both the aural and the visual segmentation tasks but the nature of the influence was not identical for both contexts.

The two task variables of length and position seemed to have influenced the children's performances with both the aural context and the visual context. Length and position, which seem to be related task variables, probably influenced the aural context task differently than the visual context task. The role of memory may have been the causative factor behind the length and position variables in the aural context. While in the visual context, the role of fatigue may

have been the causative factor.

Therefore the following results of the analyses of the task variables can be stated:

1. The length of the sentence influenced the children's performances with the aural and the visual contexts of the segmentation tasks. Generally, fewer errors occurred on the shorter sentences, although a uniform pattern was not present for either context.

2. Relative position within the sentence influenced the children's performances on the segmentation task. The highest percentages of aural and visual errors were at the end position of the sentences.

3. When sentence length was held constant, sentence type did not influence the children's performance with the aural context or the visual context of the segmentation task. The number of errors was similar for every sentence type, although a small range of errors did occur within each grade level.

Summary. Research Question 1 queried whether there was a consistent, systematic error pattern in the performances of pre-school, kindergarten, and first grade children on the visual and aural segmentation tasks. To answer the question, the errors were examined in four different ways. The first analysis consisted of a general comparison of the children's performances on the aural and visual contexts. From the general examination, the following observations were made:

1. No child segmented correctly with the aural context only, while 18 children segmented correctly with the visual context only.

2. More first graders and more readers correctly segmented either with both contexts or with the visual context only.

3. More children mastered both contexts or the visual context only than mastered the aural context only.

4. More first graders than kindergarteners or pre-schoolers mastered both contexts or the visual context only.

5. More readers than readiness or non-readiness children mastered both contexts or the visual context only.

The second analysis consisted of a systematic categorization of the errors committed on the visual segmentation task. From the categorization, the following results were stated:

1. Fewer visual context errors were committed as higher grade levels were tested.

2. Five types of visual context errors were committed: whole sentence errors, individual letter errors, "a" omission errors, division errors, and combination errors.

3. Fewer types of visual context errors were committed by first graders than by kindergarteners or pre-schoolers.

4. In the first grade group, only two types of errors were committed. One child committed only "a" omission errors and another child committed only individual letter errors.

5. Kindergarteners and pre-schoolers committed every type of visual context error. The descending order of frequency was combination errors, whole sentence errors, individual letter errors, division errors, "a" omission errors and idiosyncratic errors.

6. Since the majority of division errors occurred at ascending (t) or descending (p) letters, the configuration of the letter may have been a criterion indicating word boundary.

7. In an analysis of both division and combination errors, the majority of errors contained three, four, or five letters indicating that an arbitrary length may have been a criterion for word boundary.

The third analysis consisted of a systematic categorization of the errors committed on the aural segmentation task. From the categorization, the following results were stated:

1. The stress error classification scheme, accounting for nearly all of the aural context errors committed, was the most inclusive explanation of aural context errors, when compared with the major constituent classification scheme or the functor inclusion classification scheme.

2. First graders committed fewer stress errors, major constituent errors, and functor inclusion errors than pre-schoolers or kindergarteners.

3. Pre-schoolers' and kindergarteners' stress errors occurred most often on phrases, while first graders' stress errors occurred most often on syllables.

4. The syllable stress error was the only stress error which did not numerically decrease as higher grade levels were tested.

5. The majority of major constituent errors involved a noun phrase constituent and Det + N was the most common error.

6. Although every grade level committed all three functor inclusion errors, the Det + N functor inclusion error was the most common error.

The fourth analysis consisted of an examination of task variables. From the examination, the following results were stated:

1. The length of the sentence influenced the children's performances with the aural and visual contexts of the segmentation tasks. Generally, fewer errors occurred with the shorter sentences, although a uniform pattern was not present for either context.

2. Relative position within the sentence influenced the children's performances on the segmentation

task. The highest percentages of aural and visual errors were at the end position of the sentences.

3. When sentence length was held constant, sentence type did not influence the children's performances with the aural context or the visual context of the segmentation task. The number of errors was similar for every sentence type, although a small range of errors did occur within each grade level.

Research Question 2: Are children's abilities to explain the terminology of reading (letter, word, and sentence) on an explanation task reflective of the grade level (pre-school, kindergarten, first grade) and/or the reading ability (non-readiness, readiness, reader) of the children?

The second research question was investigated through interview questions about the reading terms of letter, word, and sentence. Two questions -- "What is a (letter)?" and "What do we use (letters) for?" -- were used to probe the children's abilities to explain the terms. The definition question was considered very difficult to answer. The use question was considered an interpretation of the definition question which would be easier to answer. The children might have interpreted the two questions as similar since the same answer (as abc's for letter) was supplied as a definition by one child and as a use by another child. Thus, the two questions were considered related. If a child correctly answered either question, she was scored as able to explain the term. If a child answered both questions successfully, she was scored only once. The results from the combined questions are presented after the presentation of the results for each question.

Although the children may not be able to verbalize an

explanation of the terms, the children may be able to state an example of the term. The question -- "Can you tell me a (letter) you know?" Tell me the (letter)." -- was used to assess the children's abilities to voluntarily identify an example of a term. The identification question was not considered simply a recognition question since no response array was present.

The results relating to children's explanations of the terminology of reading are organized according to the reading term involved. The results concerning the term letter are reported first, then the results regarding the term word, and finally the results regarding the term sentence.

Results relating to the term "letter". The children had difficulty verbalizing a definition for the term letter (Table 3.22). Only nine children or 20% of the total sample were able to correctly answer the definition question "What is a letter?" Seventeen children or 38% of the total sample did not choose to answer the question. Fourteen children or 31% of the sample chose to give an example of the term as an appropriate answer.

The first graders' answers to the question "What is a letter?" differed from the kindergarteners' and the preschoolers' answers, indicating a greater understanding of the term letter. Fewer first graders (n=4, 27%) refused to answer the question than kindergarteners (n=7, 47%) or preschoolers (n=6, 40%). More first graders gave correct

Table 3.22

THE ANSWERS TO THE QUESTION "WHAT IS A LETTER?" GIVEN BY CHILDREN IN DIFFERENT GRADE LEVELS

| Answers | Grade Levels[a] Pre-school # | % | Kindergarten # | % | First Grade # | % | Total[b] # | % |
|---|---|---|---|---|---|---|---|---|
| Correct definition | 2 | 13 | 2 | 13 | 5 | 33 | 9 | 20 |
| Incorrect definition | 4 | 27 | 0 | 0 | 1 | 7 | 5 | 11 |
| Gave an example | 3 | 20 | 6 | 40 | 5 | 33 | 14 | 31 |
| No answer | 6 | 40 | 7 | 47 | 4 | 27 | 17 | 38 |

[a] n=15

[b] N=45

definitions (n=5, 33%) than kindergarteners (n=2, 13%) or pre-schoolers (n=2, 13%). The definitions scored as correct were similar to the following statements: "Something you say in the abc's.", "part of a word," "something you spell with," "it is used in words."

More pre-schoolers (n=4, 27%) gave incorrect definitions for the term letter than first graders (n=1, 7%) or kindergarteners (n=0). With the incorrect definitions, the children conveyed a semantic (as opposed to technical) interpretation of letter: "Someone writes 'em to someone far away.", "Something that gives you a friend.", "Something you write to people.", "An envelope". Reid (1966) and Down-

ing (1969-70, 1970, 1971-72) did not report any statements involving a semantic interpretation of the term. Both authors reported confusions of the technical terms letter, number, and word but these did not occur in answer to the definition question.

When the children's answers were reclassified according to the reading abilities of the children, the readers exhibited the most understanding of the term letter (Table 3.23). More readers (n=6, 33%) gave a correct definition for the term. Only one readiness child (7%) and two non-readiness children (15%) gave correct definitions. A lower percentage of readers (33%) and non-readiness children (31%) chose not to answer the question than the percentage of readiness children (50%). More readiness children (43%) gave an example in answer to the question than non-readiness children (23%) or readers (28%).

Thus, considering the definition question only, 20% of the total sample were able to define the term letter. More first graders (33%) than pre-schoolers (13%) or kindergarteners (13%) were able to verbalize a definition. More readers (33%) than non-readiness children (15%) or readiness children (7%) were able to verbalize a definition. The result that first graders and readers were better able to verbalize a definition for the term letter supports the conclusions reported by Reid (1966) and Downing (1969-70, 1970, 1971-72). As children gained experience in reading

Table 3.23

THE ANSWERS TO THE QUESTION "WHAT IS A LETTER?" GIVEN BY CHILDREN WITH DIFFERENT READING ABILITIES

| Answers | Reading Abilities: Non-readiness (n=13) # | % | Readiness (n=14) # | % | Reader (n=18) # | % |
|---|---|---|---|---|---|---|
| Correct definition | 2 | 15 | 1 | 7 | 6 | 33 |
| Incorrect definition | 4 | 31 | 0 | 0 | 1 | 6 |
| Gave an example | 3 | 23 | 6 | 43 | 5 | 28 |
| No answer | 4 | 31 | 7 | 50 | 6 | 33 |

during the first school year, their understanding of the technical terms increased (Reid, 1966; Downing, 1969-70, 1970, 1971-72).

As presented in Table 3.24, twenty-seven children or 59% of the total sample answered the question "What do we use letters for?" More kindergarteners (n=13, 87%) gave a correct use for letters than first graders or pre-schoolers. Nine first graders (60%) gave a use but only seven (47%) were correct. The two incorrect uses were counting uses which were also reported by Reid (1966), Downing (1969-70, 1970, 1971-72), and Francis (1973). Five pre-schoolers or 34% of the group mentioned a correct use for the term letter.

Table 3.24

THE ANSWERS TO THE QUESTION "WHAT DO WE USE LETTERS FOR?" GIVEN BY CHILDREN IN DIFFERENT GRADE LEVELS

| Categories of Answers | Grade Levels[a] Pre-school # | % | Kindergarten # | % | First Grade # | % | Total[b] # | % |
|---|---|---|---|---|---|---|---|---|
| In names and words | 3 | 20 | 3 | 20 | 4 | 27 | 10 | 22 |
| Spelling | 1 | 7 | 5 | 33 | 2 | 13 | 8 | 18 |
| Alphabet | 1 | 7 | 4 | 27 | 1 | 7 | 6 | 13 |
| When one writes | 0 | 0 | 1 | 7 | 0 | 0 | 1 | 2 |
| Counting | 0 | 0 | 0 | 0 | 2 | 13 | 2 | 4 |
| TOTAL NUMBER OF ANSWERS | 5 | 34 | 13 | 87 | 9 | 60 | 27 | 59 |
| No answer given | 10 | 67 | 2 | 13 | 6 | 40 | 18 | 40 |

[a] n=15

[b] N=45

*The percents do not total 100 due to rounding error.

A total of 18 children or 40% of the sample did not answer the use question. More pre-schoolers (n=10, 67%) than kindergarteners (n=2, 13%) or first graders (n=6, 40%) chose not to respond.

All of the correct categories were mentioned by the kindergarteners, while the first graders and the pre-schoolers mentioned three of the four correct categories.

Thus, there was little difference in the range of uses mentioned by the children. Also, within each grade level, the number of instances cited for each category did not differ greatly. Pre-schoolers mentioned the In Names or Words Category three times (20%) and the Spelling and Alphabet categories once each (7%). Kindergarteners cited five instances in the Spelling category (33%), four instances in the Alphabet category (27%), three instances for the In Names or Words category (20%) and one instance in the When One Writes category (7%). First graders mentioned four instances for the In Names or Words category (27%), two instances for the Spelling category (13%), and one instance for the Alphabet category (7%).

As depicted in Table 3.25, more readiness children (n=11, 79%) correctly answered the use question than readers (n=8, 45%) or non-readiness children (n=6, 46%). The two incorrect answers were stated by readers. A greater percentage of non-readiness children (n=7, 54%) chose not to answer the question than readers (n=8, 44%) or readiness children (n=3, 21%).

In accordance with the results for the grade levels, the percentage of answers in each category did not differ greatly within each reading ability group. The readers cited five instances for the In Names or Words category (28%), three instances for the Spelling category (17%) and two instances (11%) for the incorrect Counting category.

Table 3.25

THE ANSWERS TO THE QUESTION "WHAT DO WE USE LETTERS FOR?" GIVEN BY CHILDREN WITH DIFFERENT READING ABILITIES

| Categories of Answers | Reading Abilities: Non-readiness (n=13) # | % | Readiness (n=14) # | % | Reader (n=18) # | % |
|---|---|---|---|---|---|---|
| In Names or words | 1 | 8 | 4 | 29 | 5 | 28 |
| Spelling | 2 | 15 | 3 | 21 | 3 | 17 |
| Alphabet | 3 | 23 | 3 | 21 | 0 | 0 |
| When one writes | 0 | 0 | 1 | 7 | 0 | 0 |
| Counting | 0 | 0 | 0 | 0 | 2 | 11 |
| TOTAL NUMBER OF ANSWERS | 6 | 46 | 11 | 79 | 10 | 56 |
| No answer given | 7 | 54 | 3 | 21 | 8 | 44 |

The readiness children cited four instances for the In Names or Words category (29%), three instances for the Alphabet category (21%), three instances for the Spelling category (21%) and one instance for the When One Writes category (7%). The non-readiness children gave three instances for the Alphabet category (23%), two instances for the Spelling category (15%), and one instance for the In Names or Words category (8%).

Thus, considering the use question only, 56% of the total sample cited correct uses of letter. More kindergar-

teners (87%) cited correct uses than first graders (47%) or pre-schoolers (33%). More readiness children (79%) than readers (45%) or non-readiness children (46%) mentioned correct uses. The number of categories mentioned by children in each grade level and in each reading ability did not differ greatly. No children in one particular grade level or reading ability mentioned one category appreciably more often than the other categories. Thus, the only differences in the grade levels or reading abilities occurred in the number of children responding.

The fact that more kindergarteners and more readiness children correctly answered the use question indicated that they understood the use question better than the definition question. The different wording of the question allowed the kindergarteners and the readiness children to communicate their understanding of the term letter.

When the correct answers to the definition question and the use question were combined, 67% of the children in the total sample explained the term letter (Table 3.26). More kindergarteners (93%) than first graders (60%) or pre-schoolers (47%) were able to verbalize an explanation for the term letter. The kindergartenders responded more to the use question (80%), while only one kindergartener (7%) gave a definition and one kindergartener (7%) answered both questions. Pre-schoolers also responded more to the use question (33%) than the definition question (13%), while no

Table 3.26

THE ABILITY OF CHILDREN IN DIFFERENT GRADE LEVELS TO EXPLAIN THE TERM LETTER

| Correct Answers | Grade Levels[a] Pre-school # | % | Kindergarten # | % | First Grade # | % | Total[b] # | % |
|---|---|---|---|---|---|---|---|---|
| Definitions and Use Questions | 0 | 0 | 1 | 7 | 3 | 20 | 4 | 9 |
| Definition Question | 2 | 13 | 1 | 7 | 2 | 13 | 5 | 11 |
| Use Question | 5 | 33 | 12 | 80 | 4 | 27 | 21 | 47 |
| TOTAL NUMBER OF ANSWERS | 7 | 47 | 14 | 93 | 9 | 60 | 30 | 67 |

[a] n=15

[b] N=45

pre-schooler answered both questions. The first graders' answers were more evenly spread across the questions. Four first graders or 27% answered the use question; two or 13% answered the definition question; and three or 20% answered both questions.

In Table 3.27, the correct explanations for the term letter are organized according to the reading abilities of the children. More readiness children (86%) answered the questions than readers (62%) or non-readiness children (54%). The readiness children primarily answered the use question (79%), while only one readiness child answered

Table 3.27

THE ABILITY OF CHILDREN WITH DIFFERENT READING ABILITIES TO EXPLAIN THE TERM LETTER

| Correct Answers | Reading Abilities: Non-readiness (n=13) # | % | Readiness (n=14) # | % | Readers (n=18) # | % |
|---|---|---|---|---|---|---|
| Definitions and Use Questions | 1 | 8 | 0 | 0 | 3 | 17 |
| Definition Question | 1 | 8 | 1 | 7 | 3 | 17 |
| Use Question | 5 | 38 | 11 | 79 | 5 | 28 |
| TOTAL | 7 | 54 | 12 | 86 | 11 | 62 |

the definition question and no one answered both questions. The non-readiness children also primarily answered the use question (38%), while one child answered the definition question and one child answered both questions. More of the readers answered the use question (28%) but three readers (17%) answered the definition question and three (17%) answered both questions.

Thus, two-thirds of the sample explained the term letter when the answers to the use and the definition questions were combined. More kindergarteners explained the term letter than first graders or pre-schoolers, although a majority of the first graders and nearly a majority of the pre-schoolers explained the term letter. More readiness

children explained the term letter than readers or non-readiness children, although a majority of the latter groups also explained the term.

The results from the use question do not corroborate the increasing grade level progression found with the definition question. Because the kindergarteners and the readiness children answered the use question so prolificly, a progression of increasing understanding with increasing grade level cannot be stated. But since two-thirds of the sample verbalized a definition or use, the term letter was generally understood.

The question "Can you tell me a (letter) you know? Tell me any (letter) you know." required the child to supply an example of the term without any aid but did not require an explanation of the term. Although a majority of the total sample, thirty-six children or 80% of the sample, gave a correct example of the term letter, differences among the grade levels did occur (Table 3.28). More kindergarteners (n=14, 93%) and more first graders (n=13, 87%) gave correct examples than pre-schoolers (n=9, 60%). More pre-schoolers (n=5, 33%) chose not to answer than first graders (n=1, 7%) or kindergarteners (n=0).

Three of the pre-schoolers and the one first grader who chose not to respond had defined the term letter as an item to be mailed and seemed confused by the request for an example. One pre-schooler who gave a semantic definition did give a correct example for the term letter.

Table 3.28

EXAMPLES OF THE TERM LETTER GIVEN BY CHILDREN IN DIFFERENT GRADE LEVELS

| Examples | Grade Levels[a] Pre-school # | % | Kindergarten # | % | First Grade # | %* | Total[b] # | % |
|---|---|---|---|---|---|---|---|---|
| Correct | 9 | 60 | 14 | 93 | 13 | 87 | 36 | 80 |
| Incorrect | 1 | 7 | 1 | 7 | 1 | 7 | 3 | 7 |
| No Example | 5 | 33 | 0 | 0 | 1 | 7 | 6 | 13 |

[a] n=15

[b] N=45

*The percents do not total 100 due to rounding error.

One person in each grade level incorrectly gave an example of a number instead of a letter, which concurs with the reports of Reid (1966) and Downing (1969, 1970, 1971-72).

When the data were reorganized according to the reading abilities of the children (Table 3.29), the differences found among the grade levels were again reflected. The reader and readiness groups indicated more understanding of the term letter, since 83% of the readers and 93% of the readiness group gave a correct example. Only 62% of the non-readiness group gave a correct example. Fewer readers (11%) and no readiness children chose not to answer the request, while 31% of the non-readiness children chose not

Table 3.29

EXAMPLES OF THE TERM LETTER GIVEN BY CHILDREN WITH DIFFERENT READING ABILITIES

| Examples | Reading Abilities: Non-readiness (n=13) # | % | Readiness (n=14) # | % | Reader (n=18) # | % |
|---|---|---|---|---|---|---|
| Correct | 8 | 62 | 13 | 93 | 15 | 83 |
| Incorrect | 1 | 8 | 1 | 7 | 1 | 6 |
| No Example | 4 | 31 | 0 | 0 | 2 | 11 |

to answer. One person in each reading ability group gave the incorrect example of a number for the term letter.

Thus, 80% of the children in the total sample stated a correct example for the term letter. More kindergarteners (93%) and more first graders (87%) gave correct examples than pre-schoolers (60%). More readiness children (93%) and more readers (83%) than non-readiness children (62%) gave correct examples. Consequently, differences did occur between grade levels and reading abilities in their respective knowledge of the class members included by the term letter.

In summary, the results related to the term letter were that a majority of the children in the sample explained the reading term letter and, without aid, gave an example of the term. Differences among grade levels and reading abilities occurred depending upon the specific question

asked. Considering only the definition question, 20% of the total sample explained the term letter. More first graders and more readers gave definitions. Considering only the use question, 56% of the total sample cited uses for letters. More kindergarteners and more readiness children answered the use question. When the correct answers to the definition question and the use question were combined, 67% of the total sample explained the term letter. Since more kindergarteners and readiness children answered the use question compared to the definition question, more kindergarteners and readiness children explained the term letter than first graders and readers. Thus, the ability to explain the term letter did not increase with increasing grade levels or increasing reading abilities.

When asked to give an example of the term letter, 80% of the total sample recalled a letter. More kindergarteners and more first graders gave examples. More readiness children and more readers gave examples.

A comparison of the percentage of children who explained the term letter to the percentage of children who cited an example of the term illuminated the difference in the tasks. Sixty-seven percent of the sample explained the term, while nearly all of the kindergarteners (93%) and first graders (87%) cited an example. Clearly the term letter was understood by the children but the form of the required task determined how many children communicated

their understanding.

The incorrect answers to all three questions involved either the term number or a semantic interpretation of letter as an item to be mailed. One child in each grade level and in each reading ability gave a number as an example of a letter. Two first grade readers gave counting as a use for letters.

Four non-readiness pre-schoolers defined a letter as an item to be mailed and two of them continued the interpretation stating that the mail box was a place to see a letter. One first grade reader defined a letter as an item to be mailed and the mailbox as a place to see letters.

Since the confusions of the term letter were committed by first graders and by readers, the study supports Downing's reports (1969-70, 1970, 1971-72) of the persistence of the confusion. The study does not concur with the studies by Reid (1966) and Francis (1973) which reported that the terms were explained at the end of the first year.

Results relating to the term "word". Nine children or 20% of the sample gave a correct definition in answer to the question "What is a word?" (Table 3.30). Two children, incorrectly defined the term word. Eight children or 18% of the sample gave a correct example in answer to the question. And, 26 children or 58% of the total sample did not attempt an answer.

Table 3.30

THE ANSWERS TO THE QUESTION "WHAT IS A WORD?" GIVEN BY CHILDREN IN DIFFERENT GRADE LEVELS

| Answers | Grade Levels[a] Pre-school # | % | Kindergarten # | % | First Grade # | % | Total[b] # | % |
|---|---|---|---|---|---|---|---|---|
| Correct definition | 2 | 13 | 3 | 20 | 4 | 27 | 9 | 20 |
| Incorrect definition | 1 | 7 | 0 | 0 | 1 | 7 | 2 | 4 |
| Gave an example | 5 | 33 | 0 | 0 | 3 | 20 | 8 | 18 |
| No answer | 7 | 47 | 12 | 80 | 7 | 47 | 26 | 58 |

[a] n=15

[b] N=45

*The percents do not total 100 due to rounding error.

When questioned about the term word, pre-schoolers and first graders answered more similarly than kindergarteners. Fewer pre-schoolers (n=7, 47%) and fewer first graders (n=7, 47%) chose not to answer the question than kindergarteners (n=12, 80%). Five pre-schoolers (33%) gave an example as an answer and three first graders (20%) chose the same option. No kindergarteners gave an example as an answer.

The incorrect definitions were given by a pre-schooler and a first grader. The pre-schooler confused the term word with the term letter -- "A word is something to spell with." The letter-word confusion was expected since Reid (1966), and

Downing (1969-70, 1970, 1971-72) reported the same confusion. The first grader used the terms letter and sentence as synonyms for the term word. The generalized confusion of all three terms by a first grader supported the contention that the confusion persisted beyond the first year (Downing, 1969-70, 1970, 1971-72).

The correct definitions included "something you say," "when you spell something," "using lots of letters," "something to put in a sentence." The number of correct definitions increased with higher grade levels. Two pre-schoolers or 13% of the group, three kindergarteners or 20% of the group, and four first graders or 27% of the group were correct.

One difference among the reading abilities occurred (Table 3.31). More readers (n=5, 28%) gave a correct definition than the readiness children (n=2, 14%) or the non-readiness children (n=2, 15%). Only small differences among the reading ability groups occurred in the other categories of answers. The proportion of children choosing not to respond to the question -- 62% of the non-readiness children, 64% of the readiness children, and 50% of the readers -- exhibited small differences among the reading abilities. The proportion of children choosing to give an example in answer to the question -- 23% of the non-readiness children, 14% of the readiness children, and 17% of the readers -- also exhibited small differences among the read-

Table 3.31

THE ANSWERS TO THE QUESTION "WHAT IS A WORD?" GIVEN BY CHILDREN WITH DIFFERENT READING ABILITIES

| Answers | Reading Abilities: Non-readiness (n=13) # | % | Readiness (n=14) # | %* | Reader (n=18) # | % |
|---|---|---|---|---|---|---|
| Correct definition | 2 | 15 | 2 | 14 | 5 | 28 |
| Incorrect definition | 0 | 0 | 1 | 7 | 1 | 6 |
| Gave an example | 3 | 23 | 2 | 14 | 3 | 17 |
| No answer | 8 | 62 | 9 | 64 | 9 | 50 |

*The percents do not total 100 due to rounding error.

ing abilities. The incorrect definitions were supplied by one readiness child and by one reader.

Thus, considering the definition only, 20% of the total sample explained the term word. Increasingly more children defined the term word as higher grade levels were questioned -- 13% of the pre-schoolers, 20% of the kindergarteners, and 27% of the first graders. More readers (28%) than non-readiness children (15%) or readiness children (14%) defined the term word. The results confirmed Reid's (1966), Downing's (1969-70, 1970, 1971-72) and Francis' (1973) conclusions that the children's understanding of reading terms increased as their experience with reading

increased.

No differences occurred among the children's answers to the question "What do we use words for?" (Table 3.32). Six children (40%) in each grade level answered the question, although one pre-schooler answered incorrectly -- "You get numbers to get words." Nine children in each grade level (60%) did not choose to answer the question.

Table 3.32

THE ANSWERS TO THE QUESTION "WHAT DO WE USE WORDS FOR?" GIVEN BY CHILDREN IN DIFFERENT GRADE LEVELS

| Categories of Answers | Grade Levels[a] Pre-school # | % | Kindergarten # | % | First Grade # | % | Total[b] # | % |
|---|---|---|---|---|---|---|---|---|
| Oral communication | 3 | 20 | 4 | 27 | 3 | 20 | 10 | 22 |
| Written communication | 2 | 13 | 2 | 13 | 3 | 20 | 7 | 16 |
| Incorrect | 1 | 7 | 0 | 0 | 0 | 0 | 1 | 2 |
| TOTAL NUMBER OF ANSWERS | 6 | 40 | 6 | 40 | 6 | 40 | 18 | 40 |
| No answer | 9 | 60 | 9 | 60 | 9 | 60 | 27 | 60 |

[a] n=15

[b] N=45

When questioned about the uses of words, fewer children gave answers classified in the written communication category (n=7, 16%) than in the oral communication category (n=10,

22%). Two pre-schoolers (13%), two kindergarteners (13%), and three first graders (20%) gave answers classified as written communication. Answers categorized as written communication were similar to the following examples: "people write 'em down for people," "for writing things," "to read," "for spelling and writing," "to find out, to learn, to read". Three pre-schoolers (20%), four kindergarteners (27%), and three first graders (20%) gave answers classified as oral communication. The children's oral communication answers were similar to the following examples: "to name things, like dogs," "to talk," "to tell people something," "people say 'em," "to tell what you're thinking of."

The reclassification of the data according to the reading abilities of the children showed small progressions (Table 3.33). The oral communication category was mentioned by more non-readiness children (n=4, 31%) than readiness children (n=3, 21%) or readers (n=3, 17%). Written communication was mentioned by more readers (n=4, 22%) than non-readiness children (n=1, 8%) or readiness children (n=2, 14%). The proportion of children who answered the question did not differ greatly -- 38% of the non-readiness group, 43% of the readiness group, and 39% of the reader group. The proportion of children who chose not to answer the question did not decrease as higher reading abilities were asked -- 62% of the non-readiness group, 57% of the readiness group, and 61% of the reader group.

Thus, considering only the use questions for the term

Table 3.33

THE ANSWERS TO THE QUESTION "WHAT DO WE USE WORDS FOR?" GIVEN BY CHILDREN WITH DIFFERENT READING ABILITIES

| Categories of Answers | Reading Abilities: Non-readiness (n=13) # | % | Readiness (n=14) # | % | Reader (n=18) # | % |
|---|---|---|---|---|---|---|
| Oral communication | 4 | 31 | 3 | 21 | 3 | 17 |
| Written communication | 1 | 8 | 2 | 14 | 4 | 22 |
| Incorrect | 0 | 0 | 1 | 7 | 0 | 0 |
| TOTAL NUMBER OF ANSWERS | 5 | 38 | 6 | 43 | 7 | 39 |
| No answers | 8 | 62 | 8 | 57 | 11 | 61 |

word, no differences among the children's answers occurred. Forty percent of the children in each grade level answered the question. More answers were classified in the category of oral communication (22%) than in the category of written communication (16%), but again the grade levels did not differ. Small differences occurred when the data were re-classified according to reading abilities. The readers mentioned the written communication category more often (22%) than the readiness children (14%) or the non-readiness children (8%). The non-readiness children mentioned the oral communication category more often (31%) than the readiness children (21%) or the readers (17%). Therefore, the progression of increasing understanding of the terms

and of increasing reading experience (Reid, 1966; Downing, 1969-70, 1970, 1971-72; Francis, 1973) was generally not supported when the use question was considered.

When the correct answers to the definition question and the use question were combined, 49% of the total sample explained the term word (Table 3.34). More first graders (n=9, 60%) explained the term word than kindergarteners (n=7, 47%) or pre-schoolers (n=6, 41%). More first graders answered only the definition question (n=3, 20%) or only the use question (n=5, 33%) than kindergarteners or pre-schoolers.

Table 3.34

THE ABILITY OF CHILDREN IN DIFFERENT GRADE LEVELS TO EXPLAIN THE TERM WORD

| Correct Answers | Grade Levels[a] Pre-school # | % | Kindergarten # | % | First Grade # | % | Total[b] # | % |
|---|---|---|---|---|---|---|---|---|
| Definitions and Use Questions | 1 | 7 | 2 | 13 | 1 | 7 | 4 | 9 |
| Definition Questions | 1 | 7 | 1 | 7 | 3 | 20 | 5 | 11 |
| Use Question | 4 | 27 | 4 | 27 | 5 | 33 | 13 | 29 |
| TOTAL | 6 | 41 | 7 | 47 | 9 | 60 | 22 | 49 |

[a] n=15

[b] N=45

The use question was answered more often than the definition question by all grade levels. Five first graders (33%) answered the use question; three (20%) answered the definition question; and one (7%) answered both questions. Four kindergarteners (27%) answered the use question; one (7%) answered the definition question and two (13%) answered both questions. Four pre-schoolers (27%) answered the use question; one (7%) answered the definition question; and one (7%) answered both questions.

When the correct explanations were classified according to the reading abilities of the children, the superiority of the readers became apparent (Table 3.35). Eleven readers (61%) explained the term word, while only six readiness children (43%) and five non-readiness children (38%) explained the term.

More readers than readiness or non-readiness children answered the use question only or the definition question only. Six readers (33%) answered the use question; four (22%) answered the definition question; and one (6%) answered both questions. Four readiness children (29%) answered the use question; one (7%) answered the definition question; and one (7%) answered both questions. Three non-readiness children (23%) answered the use question; no one answered the definition question; and two (15%) answered both questions.

Therefore, nearly half of the sample (49%) explained

Table 3.35

THE ABILITY OF CHILDREN WITH DIFFERENT READING ABILITIES TO EXPLAIN THE TERM WORD

| Correct Answers | Reading Abilities: Non-readiness (n=13) # | % | Readiness (n=14) # | % | Reader (n=18) # | % |
|---|---|---|---|---|---|---|
| Definition and Use Questions | 2 | 15 | 1 | 7 | 1 | 6 |
| Definition Question | 0 | 0 | 1 | 7 | 4 | 22 |
| Use Questions | 3 | 23 | 4 | 29 | 6 | 33 |
| TOTAL | 5 | 38 | 6 | 43 | 11 | 61 |

the term word when the definition and use questions were combined. More first graders than kindergarteners or preschoolers and more readers than readiness or non-readiness children explained the term. When the questions were combined, the increasing progression reported by Reid (1966), Downing (1969-70, 1970, 1971-72) and Francis (1973) was supported.

The question "Can you tell me any word you know? Tell me a word you know." required the child to remember, without aid, a member of the class of words. Thirty-three of the children (73%) gave a correct example of the term word (Table 3.36). Six children gave a name as an example which agreed with Reid's (1966) and Francis' (1973) reports

Table 3.36

EXAMPLES OF THE TERM WORD GIVEN BY CHILDREN IN DIFFERENT GRADE LEVELS

| Examples | Grade Levels[a] Pre-school # | % | Kindergarten # | % | First Grade # | % | Total[b] # | % |
|---|---|---|---|---|---|---|---|---|
| Correct | 9 | 60 | 10 | 67 | 14 | 93 | 33 | 73 |
| Incorrect | 3 | 20 | 0 | 0 | 0 | 0 | 3 | 7 |
| No Example | 3 | 20 | 5 | 33 | 1 | 7 | 9 | 20 |

[a] n=15

[b] N=45

that children treated name and word synonomously. Two first graders gave an example which could be scored either as a word or as a letter when heard -- "a" and "are". The examples were scored as a word.

Differences among the grade levels occurred when the children were asked to state an example of a word. Progressively more children stated correct examples as children in higher grade levels were questioned -- nine pre-schoolers (60%), ten kindergarteners (67%), and fourteen first graders (93%). Only one first grader chose not to respond, while five kindergarteners (33%) and three pre-schoolers (20%) chose not to respond. Three pre-schoolers were the only children to give incorrect examples. Two children gave an example of a letter supporting the findings of Reid (1966)

and Downing (1969-70, 1970, 1971-72). The other child stated an example which could not be interpreted.

As presented in Table 3.37, the reclassification of the data by the reading abilities of the children showed that more readers (n=15, 83%) gave a correct example for the term word than readiness children (n=9, 64%) or non-readiness children (n=9, 64%). Progressively fewer children chose not to respond as children in higher reading abilities were questioned -- four non-readiness children (31%), three readiness children (21%), and two readers (11%). The incorrect examples were given by two readiness children and by one reader.

Table 3.37

EXAMPLES OF THE TERM WORD GIVEN BY CHILDREN WITH DIFFERENT READING ABILITIES

| | Reading Abilities | | | | | |
|---|---|---|---|---|---|---|
| | Non-readiness (n=13) | | Readiness (n=14) | | Reader (n=18) | |
| Examples | # | % | # | %* | # | % |
| Correct | 9 | 69 | 9 | 64 | 15 | 83 |
| Incorrect | 0 | 0 | 2 | 14 | 1 | 6 |
| No Example | 4 | 31 | 3 | 21 | 2 | 11 |

*Percents do not total 100 due to rounding error.

Thus, 73% of the total sample stated a correct example for the term word. Differences among the grade levels and the reading abilities occurred. More children gave correct

examples as children in higher grade levels were questioned -- 60% of the pre-schoolers, 67% of the kindergarteners, and 93% of the first graders. More readers (83%) gave correct examples for the term. These differences among the grade levels and the reading abilities substantiated the progression of understanding reported by Reid (1966), Downing (1969-70, 1970, 1971-72), and Francis (1973).

In summary, the results related to the term word were that nearly half or 49% of the total sample explained the term word and that nearly three-quarters or 73% of the sample cited an example. More first graders and readers were able to explain the term word than children in the other grade levels and reading abilities. When each question was considered separately, the definition question was the crucial difference among the grade levels and reading abilities. Increasingly more children could answer the definition question as children in higher grade levels were questioned. While no differences among the grade levels occurred with the use question, more children in each grade-level answered the use question than the definition question. More readers answered the definition question than children in the other reading ability groups, while only small differences among the reading ability groups occurred with the use question.

When no explanation was required and the child had to remember without aid an example of the term word, 73% of the

sample knew a member of the class. Increasingly more children gave an example as children in higher grade levels were questioned and more readers gave an example than children of lower reading abilities. Thus, although nearly three-fourths of the sample knew an example, differences among the grade levels and reading abilities occurred.

A comparison of the percentage of children who explained the term word to the percentage of children who cited an example of the term word exhibited the difference in the two tasks. Nearly half of the sample (49%) explained the term, while nearly three-quarters of the sample (73%) recalled an example. Most of the children understood the term word but the communication of the understanding was dependent on whether the task required verbalization or identification skills.

The incorrect answers to all three questions primarily involved a confusion between the terms word and letter. The term word was defined as a letter by two pre-school readiness children and one first grade reader. Two pre-schoolers (a readiness child and a reader) gave a letter as an example of a word. Two first grade readers mentioned that words were seen in the alphabet. Two other confusions were made. The first grade reader who mentioned letter as a synonym for word also mentioned sentences as a synonym for word. One of the pre-school readiness children stated that numbers were used to get words. Since first grade readers confused

the terms, the study corroborated the finding that children were confused about the terms beyond their first year of reading as reported by Downing (1969-70, 1970, 1971-72). The study did not agree with the reports of Reid (1966) and Francis (1973) that the terms were explained by the end of the first year.

Results relating to the term "sentences". The differences among the children's answers to the definition question "What is a sentence?" are presented in Table 3.38.

Table 3.38

THE ANSWERS TO THE QUESTION "WHAT IS A SENTENCE?" GIVEN BY CHILDREN IN DIFFERENT GRADE LEVELS

| Answers | Grade Levels[a] Pre-school # | % | Kindergarten # | % | First Grade # | % | Total[b] # | % |
|---|---|---|---|---|---|---|---|---|
| Correct Definition | 1 | 7 | 0 | 0 | 5 | 33 | 6 | 13 |
| Incorrect Definition | 3 | 20 | 0 | 0 | 3 | 20 | 6 | 13 |
| Gave an Example | 0 | 0 | 0 | 0 | 3 | 20 | 3 | 7 |
| No Answer | 11 | 73 | 15 | 100 | 4 | 27 | 30 | 67 |

[a] n=15

[b] N=45

More first graders (five first graders, one pre-schooler, and no kindergarteners) stated a correct definition for the

term sentence. Examples of the definitions scored as correct are the following statements: "something to tell things you want to tell," "what you write about someone," "when you make up a story," "words spelled in a line," "words and then a period." Only four children or 27% of the first grade did not respond, while the majority of the children in pre-school (73%) and all of the children in kindergarten chose not to respond to the question.

Incorrect definitions were given by three first graders and three pre-schoolers. Examples of the incorrect definitions are the following statements: "a dentist," "like a word and rhymes together," "a mark," "a long word," "a story," "a rebus word." Three first graders responded with an example but only one of the examples was correct. The incorrect examples were a word and a phrase.

As presented in Table 3.39, the readers' answers were different from the readiness children's and the non-readiness children's answers. Only five readers (28%) chose not to answer, while 12 non-readiness children (92%) and 13 readiness children (93%) chose not to answer the question. The correct definitions were supplied by five readers (28%) and one readiness child (7%). The incorrect definitions were given by five readers (28%) and a non-readiness child (7%).

Thus, considering only the definition question, 13 percent of the total sample explained the term sentence.

Table 3.39

THE ANSWERS TO THE QUESTION "WHAT IS A SENTENCE?" GIVEN BY CHILDREN WITH DIFFERENT READING ABILITIES

| Answers | Reading Abilities: Non-readiness (n=13) # | % | Readiness (n=14) # | % | Reader (n=18) # | %* |
|---|---|---|---|---|---|---|
| Correct Definition | 0 | 0 | 1 | 7 | 5 | 28 |
| Incorrect Definition | 1 | 8 | 0 | 0 | 5 | 28 |
| Gave an Example | 0 | 0 | 0 | 0 | 3 | 17 |
| No Answer | 12 | 92 | 13 | 93 | 5 | 28 |

*Percents do not total 100 due to rounding error.

Primarily first graders and readers attempted to answer the question. Twenty-eight percent of the readers and 33% of the first graders were correct.

Only two first grade readers exhibited an ability to verbalize about the use of sentences (Table 3.40). They stated that sentences were used to "tell what to do" and "to tell a story". The incorrect statement "to fill out a license" was also given by a first grade reader. No other grade level or reading ability attempted to respond to the question of use.

Thus, considering the use question only, only 4% of the total sample or two first grade readers were able to

Table 3.40

THE ANSWERS TO THE QUESTION "WHAT DO WE USE SENTENCES FOR?" GIVEN BY CHILDREN IN DIFFERENT GRADE LEVELS

| Categories of Answers | Grade Levels[a] Pre-school # | % | Kindergarten # | % | First Grade # | % | Total[b] # | % |
|---|---|---|---|---|---|---|---|---|
| Oral communication | 0 | 0 | 0 | 0 | 2 | 13 | 2 | 9 |
| Written communication | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Incorrect | 0 | 0 | 0 | 0 | 1 | 7 | 1 | 2 |
| No answer | 15 | 100 | 15 | 100 | 12 | 80 | 42 | 93 |

[a] n=15

[b] N=45

explain the term sentence.

When the correct explanations for the definition question and the use question were combined, 15% of the total sample explained the term sentence (Table 3.41). More first graders (n=6, 41%) explained the term than pre-schoolers (n=1, 7%) or kindergarteners (n=0). As presented in Table 3.42, more readers (n=6, 33%) explained the term sentence than non-readiness children (n=0) or readiness children (n-1, 7%). Thus, children in the highest grade level and the highest reading ability were the most successful in explaining the term sentence. The results supported Francis'

Table 3.41

THE ABILITY OF CHILDREN IN DIFFERENT GRADE LEVELS TO EXPLAIN THE TERM SENTENCE

| Correct Answers | Grade Levels[a] Pre-school # | % | Kindergarten # | % | First Grade # | % | Total[b] # | % |
|---|---|---|---|---|---|---|---|---|
| Definition and Use Question | 0 | 0 | 0 | 0 | 1 | 7 | 1 | 2 |
| Definition Question | 1 | 7 | 0 | 0 | 4 | 27 | 5 | 11 |
| Use Question | 0 | 0 | 0 | 0 | 1 | 7 | 1 | 2 |
| TOTAL | 1 | 7 | 0 | 0 | 6 | 41 | 7 | 15 |

[a] n=15

[b] N=45

Table 3.42

THE ABILITY OF CHILDREN WITH DIFFERENT READING ABILITIES TO EXPLAIN THE TERM SENTENCE

| Correct Answers | Reading Abilities: Non-readiness (n=13) # | % | Readiness (n=14) # | % | Reader (n=18) # | % |
|---|---|---|---|---|---|---|
| Definition and Use Questions | 0 | 0 | 0 | 0 | 1 | 6 |
| Definition Question | 0 | 0 | 1 | 7 | 4 | 22 |
| Use Question | 0 | 0 | 0 | 0 | 1 | 6 |
| TOTAL | 0 | 0 | 1 | 7 | 6 | 33 |

(1973) finding that more children understood the term sentence the end of first grade than at the beginning.

The definition question accounted for more of the correct explanations. Four first graders answered the definition question; one answered the use question and one answered both. One pre-schooler answered the definition question. No kindergartener answered any question. Four readers answered the definition question; one answered the use question and one answered both. One readiness child answered the definition question. No non-readiness child answered any question. Thus, if a child could explain the term sentence, the child usually responded to the first question -- the difficult definition question.

In the Francis (1973) study, the children either answered correctly or did not respond. The current study did find a high percentage of no responses -- 73% of the pre-schoolers, 100% of the kindergarteners, and 27% of the first graders. But, six children gave incorrect definitions and one child gave an incorrect answer to the use question. Thus, a few children did attempt an explanation of the term sentence, although the majority of the sample either knew a correct explanation or did not respond.

The first graders were the only children to attempt to give an example of a sentence (Table 3.43). Ten first graders (67%) were correct, while three (20%) were not. The incorrect examples were a word, a phrase, and a verse

Table 3.43

EXAMPLES OF THE TERM SENTENCE GIVEN BY CHILDREN IN DIFFERENT GRADE LEVELS

| Examples | Grade Levels[a] Pre-school # | % | Kindergarten # | % | First Grade # | % | Total[b] # | % |
|---|---|---|---|---|---|---|---|---|
| Correct | 0 | 0 | 0 | 0 | 10 | 67 | 10 | 22 |
| Incorrect | 0 | 0 | 0 | 0 | 3 | 20 | 3 | 7 |
| No Example | 15 | 100 | 15 | 100 | 2 | 13 | 32 | 71 |

[a] n=15

[b] N=45

containing two sentences.

The presentation of the data by reading abilities (Table 3.44) exhibited the superiority of the readers compared to the readiness children or the non-readiness children. [illegible] readers (50%) and one readiness child (7%) could s[illegible] a correct example of a sentence. Three readers (17%) gave incorrect examples. Fewer readers (n=6, 33%) did not respond than readiness children (n=13, 93%) or non-readiness children (n=13, 100%).

Therefore, the results relating to the term sentence were that first graders and readers explained the term sentence and gave an example of the term. One readiness pre-schooler was also successful but no other pre-schooler or kindergartener and no other readiness or non-readiness children were successful. Forty-one percent of the first graders and 33% of the readers (15% of the total sample)

Table 3.44

EXAMPLES OF THE TERM SENTENCE GIVEN BY CHILDREN WITH DIFFERENT READING ABILITIES

| Examples | Reading Abilities: Non-readiness (n=13) # | % | Readiness (n=14) # | % | Reader (n=18) # | % |
|---|---|---|---|---|---|---|
| Correct | 0 | 0 | 1 | 7 | 9 | 50 |
| Incorrect | 0 | 0 | 0 | 0 | 3 | 17 |
| No Example | 13 | 100 | 13 | 93 | 6 | 33 |

explained the term sentence indicating that the term had not been learned by the majority of the first graders or readers. Sixty-seven percent of the first graders and 50% of the readers cited an example of a sentence which supports the hypothesis that the identification question was easier than the explanation question.

Summary. The examination of children's ability to explain the terminology of reading found differences in the children's answers depending on the specific term in question, the grade level of the children, and the reading ability of the children. The following results can be stated:

1. The increasing difficulty of the terms was letter, word, sentence.
2. More kindergarteners and more first graders explained the term letter than pre-schoolers.

3. More first graders explained the term word than kindergarteners or pre-schoolers.

4. Only first graders explained the term sentence.

5. More readiness children and more readers explained the term letter than non-readiness children.

6. More readers explained the term word than readiness or non-readiness children.

7. Only readers explained the term sentence.

8. The majority of the errors involved the substitution of another term for the correct term.

9. Errors were committed by first graders and readers indicating that learning continued beyond the first year of reading lessons.

Research Question 3: Are the children's abilities to comprehend the terminology of reading (letter, word, sentence) on a recognition task reflective of the grade level (pre-school, kindergarten, first grade) and/or the reading ability (non-readiness, readiness, reader) of the children?

The third research question was converted into the following statistical hypothesis to test for significant differences:

The three grade levels (pre-school, kindergarten, and first grade) and the three reading abilities (non-readiness, readiness and reader) will exhibit no differences in the items which they select for a given item requested by the terms letter, word, sentence.

For each item requested, a chi-square test was used to determine whether the selection of the three grade levels and the three reading abilities were significantly different.

As presented in Table 3.45, the majority of the total sample selected the correct item for two of the items requested. Thirty-nine children correctly selected a letter

Table 3.45

SUMMARY TABLE OF THE ITEMS SELECTED BY THE TOTAL SAMPLE[a] FOR EACH ITEM REQUESTED

| Item Requested | Item Selected | | | | |
|---|---|---|---|---|---|
| | Number | Letter | Word | Sentence | No Response |
| Letter | 2 | 39 | 3 | 0 | 1 |
| Word | 0 | 8 | 36 | 0 | 1 |
| Sentence | 6 | 6 | 10 | 19 | 4 |

[a]N=45

and thirty-six children correctly selected a word. The sentence term was the only request that produced a variance in the response. Nineteen children correctly selected a sentence but ten incorrectly chose a word; six a letter; and six a number. Since the sentence request was the only request which produced a variance, differences among the grade levels and reading abilities were most likely to occur with the sentence request. The results relating to each term are reported in the following order: the results regarding the term letter first, then results regarding the term word and finally the results regarding the term sentence.

Results relating to the term "letter". When letter was the requested item, increasingly more children in each grade level were correct as children in higher grade levels were tested (Table 3.46). Eleven pre-schoolers, 13 kindergarteners, and fifteen first graders correctly recognized a

Table 3.46

THE ITEMS SELECTED BY CHILDREN IN DIFFERENT GRADE LEVELS FOR THE REQUESTED ITEM OF LETTER

| Grade Levels[a] | Item Selected | | | | |
|---|---|---|---|---|---|
| | Number | Letter | Word | Sentence | No Response |
| Pre-school | 1 | 11 | 2 | 0 | 1 |
| Kindergarten | 1 | 13 | 1 | 0 | 0 |
| First Grade | 0 | 15 | 0 | 0 | 0 |

[a] n=15

letter card in the array. But the differences among the grade levels were not significant (chi-square = 5.67, df = 8).

When the data for the term letter were organized according to the reading abilities of the children (Table 3.47), increasingly more children were correct as children in higher reading abilities were questioned. Eleven non-readiness children, twelve readiness children and sixteen readers were correct. But the differences among the reading abilities were not significant (chi-square = 5.22, df = 8).

The lack of statistical significance for the differences among the grade levels and reading abilities can be attributed to the success the children exhibited. As in the study by Francis (1973), an example of the term letter was easy for the children to recognize.

Table 3.47

THE ITEMS SELECTED BY CHILDREN WITH DIFFERENT READING ABILITIES FOR THE REQUESTED ITEM OF LETTER

| Reading Abilities | Item Selected | | | | |
|---|---|---|---|---|---|
| | Number | Letter | Word | Sentence | No Response |
| Non-readiness (n=13) | 1 | 11 | 0 | 0 | 1 |
| Readiness (n=14) | 1 | 12 | 1 | 0 | 0 |
| Reader (n=18) | 0 | 16 | 2 | 0 | 0 |

The error pattern indicated that the term letter was not understood by all children (Table 3.46). Five children incorrectly selected a number or a word for the request of letter which reflected the error pattern found on the interview task. The three pre-schoolers incorrectly selected one number and two words. The two kindergarteners incorrectly selected one number and one word. No first graders were incorrect.

The decreasing progression of errors exhibited among the grade levels, did not occur among the reading abilities (Table 3.47). Two children in each reading ability committed an error. One number selection and one no response were the two errors of the non-readiness group. The readiness children's two errors were a number selection and a word selec-

tion. Two readers errored by selecting a word for the term letter.

Since the word cards contained letter, the three children who incorrectly selected a word card were asked to circle one letter with a finger. The children circled the entire word. Thus, the children confused the terms letter and word.

Therefore, most of the children in the sample recognized an example of the term letter. Increasingly more children in higher grade levels and reading abilities recognized an example of the term letter but the differences were not significant. When an incorrect example was chosen, the error was either a number or a word. Children in the lower grade levels committed more errors but children in the lower reading abilities did not.

Results relating to the term "word". As presented in Table 3.48, increasingly more children in each grade level correctly selected an example for the item request of word. Nine pre-schoolers, twelve kindergarteners, and fifteen first graders correctly chose a word for the term word. But again the differences among the grade levels were not significant (chi square = 10.12, df = 8).

As depicted in Table 3.49, increasingly more children were correct as children in higher reading abilities were tested. Seven non-readiness children, 12 readiness children, and 17 readers were correct. The non-readiness

Table 3.48

THE ITEMS SELECTED BY CHILDREN IN DIFFERENT GRADE LEVELS FOR THE REQUESTED ITEM OF WORD

| Grade Levels[a] | Item Selected | | | | |
|---|---|---|---|---|---|
| | Number | Letter | Word | Sentence | No Response |
| Pre-school | 0 | 5 | 9 | 0 | 1 |
| Kindergarten | 0 | 3 | 12 | 0 | 0 |
| First Grade | 0 | 0 | 15 | 0 | 0 |

[a] n=15

Table 3.49

THE ITEMS SELECTED BY CHILDREN WITH DIFFERENT READING ABILITIES FOR THE REQUESTED ITEM OF WORD

| Reading Abilities | Item Selected | | | | |
|---|---|---|---|---|---|
| | Number | Letter | Word | Sentence | No Response |
| Non-readiness (n=13) | 0 | 6 | 7 | 0 | 0 |
| Readiness (n=14) | 0 | 2 | 12 | 0 | 0 |
| Readers (n=18) | 0 | 0 | 17 | 0 | 1 |

children responded differently from the other two groups because half the children (n=6) were incorrect. But, in spite of the errors, the differences among the reading abilities were not significant (chi square = 12.32, df = 8).

The lack of statistical significance for the differences among the grade levels and reading abilities can probably be attributed to the overall success of the children in recognizing an example for the term word. Francis (1973) had found that recognition for the term word was easy for first graders at the end of the year. Apparently the task was easy for the younger and/or less able children of the current study also.

When errors were committed, the lower grade levels and the lower reading abilities committed the errors. Only preschoolers (n=5) and kindergarteners (n=3) were incorrect. No first graders were. Only non-readiness children (n=6) and readiness children (n=2) were incorrect. No reader selected an incorrect response, although one reader did not respond.

Whenever an error was committed, the child selected an example of a letter. Thus, the confusion between letter and word found in the interview data and reported by Francis (1973) was corroborated. Francis (1973) also reported that word was confused with sentence but that confusion was not found in the present study.

Thus, the majority of the children in the sample recognized an example of the term word. Although increasingly more children in higher grade levels and reading abilities were correct, the differences were not significant. The only error type was the selection of a letter for a word

request. The children in the lower grade levels (pre-school and kindergarten) and the lower reading abilities (non-readiness and readiness) were the only children who erred. First graders and/or readers did not err.

Results relating to the term "sentence". As depicted in Table 3.50, children in the three grade levels responded differently to the sentence request. The differences among the grade levels were significant at the .05 level (chi square = 17.79, df = 8). Ten first graders successfully recognized an example of a sentence, while six pre-schoolers and only three kindergarteners were successful.

Table 3.50

THE ITEMS SELECTED BY CHILDREN IN DIFFERENT GRADE LEVELS FOR THE REQUESTED ITEM OF SENTENCE

| | Item Selected | | | | |
|---|---|---|---|---|---|
| Grade Levels[a] | Number | Letter | Word | Sentence | No Response |
| Pre-school | 4 | 2 | 2 | 6 | 1 |
| Kindergarten | 2 | 4 | 3 | 3 | 3 |
| First Grade | 0 | 0 | 5 | 10 | 0 |

[a] n=15

The differences among the reading abilities (Table 3.51) were significant (chi square = 20.59, df = 8) at the .05 level. Eleven readers correctly selected an example of a sentence, while only four readiness children and four

Table 3.51

THE ITEMS SELECTED BY CHILDREN WITH DIFFERENT READING ABILITIES FOR THE REQUESTED ITEM OF SENTENCE

| Reading Abilities | Item Selected | | | | |
|---|---|---|---|---|---|
| | Number | Letter | Word | Sentence | No Response |
| Non-readiness (n=13) | 4 | 3 | 0 | 4 | 2 |
| Readiness (n=14) | 2 | 3 | 3 | 4 | 2 |
| Reader (n=18) | 0 | 0 | 7 | 11 | 0 |

non-readiness children were correct.

The significant differences found among the grade levels and reading abilities supported the results of Francis (1973). Francis found that the term sentence was not understood until the end of the first grade.

The error patterns of the grade levels and reading abilities were also different. When first graders (Table 3.50) and/or readers (Table 3.51) erred, they selected a word. The current finding of sentence-word error type concurs with the confusion which Francis (1973) reported. In contrast, the errors made by children in the lower grade levels and the lower reading abilities were scattered across the full range of incorrect items. Clearly, the pre-school and kindergarten children or the non-readiness and readiness children were thoroughly confused by the term

sentence and were responding in a random manner.

Thus, the children in the sample were not familiar with the term sentence. Significantly more first graders and more readers recognized an example of the term sentence than children in the lower grade levels and reading abilities. When first graders and readers erred, they selected only a word item. When the children in lower grade levels and reading abilities erred, they randomly selected any item.

Summary. The following results can be stated regarding the children's abilities to comprehend the reading terms on a recognition task:

1. The majority of the children in the sample recognized examples of the terms letter and word.
2. No differences among the grade levels or reading abilities were significant when the terms letter and word were considered.
3. Significantly more first graders recognized an example of the term sentence than kindergarteners or pre-schoolers ($p < .05$).
4. Significantly more readers recognized an example of the term sentence than readiness or non-readiness children ($p < .05$).
5. The errors relating to the term letter were either numbers or words.
6. The errors relating to the term word were only letters.
7. The first graders' and readers' errors for the term sentence were only words, while the children in other grade levels and reading abilities responded randomly.

Research Question 4: Are the pre-schoolers' kindergarteners', and first graders' respective performances on the recognition task comparable to the pre-schoolers', kindergarteners', and first graders' respective performances on the explanation task?

The fourth research question concerned the two comprehension of reading terminology tasks. The explanation task was considered the most difficult task, since the child must verbalize a definition or a use of the term. As a part of the explanation task, the child was asked to state an example of the term. Since the task required no explanation and yet offered no assistance, the statement of an example was considered to be an identification task of intermediate difficulty. The recognition task, which required the child to select an example from an array, was considered the easiest. Thus, the decreasing order of difficulty for the tasks was explanation of the term, statement of an example (identification), and recognition of an example.

The number and percentage of correct performances on each task were the measures used to compare the tasks. The expectation was that increasingly more children would be correct as the difficulty of the task decreased. Thus, performance on the recognition task would not be comparable to performance on the explanation task. The results are reported according to the term involved. The results for the term letter are presented first; then the results for the term word; and finally the results for the term sentence.

Results relative to the term "letter". A comparison

of the correct performances for each grade level on the reading terminology tasks involving the term letter are presented in Table 3.52. Increasingly more children in the total sample were correct as the difficulty level of the task decreased. Sixty-seven percent of the total sample explained the term letter; 80% stated an example; and 87% recognized an example.

Table 3.52

A COMPARISON OF THE CORRECT PERFORMANCES BY CHILDREN IN DIFFERENT GRADE LEVELS ON READING TERMINOLOGY TASKS FOR THE TERM LETTER

| Tasks | Grade Levels[a] Pre-school # | % | Kindergarten # | % | First Grade # | % | Total[b] # | % |
|---|---|---|---|---|---|---|---|---|
| Explain term | 7 | 47 | 14 | 93 | 9 | 60 | 30 | 67 |
| State an example | 9 | 60 | 14 | 93 | 13 | 87 | 36 | 80 |
| Recognize an example | 11 | 73 | 13 | 87 | 15 | 100 | 39 | 87 |

[a] n=15

[b] N=45

The first graders' and the pre-schoolers' percentages illustrated the inverse relationship between task difficulty and percentage of correct performances. Forty-seven percent of the pre-schoolers explained the term letter; 60% stated an example; and 73% recognized an example. Sixty percent

of the first graders explained the term letter; 87% stated an example; and 100% recognized an example. Thus, increasingly more first graders and pre-schoolers performed correctly as the difficulty of the tasks decreased.

Nearly all the kindergarteners performed correctly on all three tasks -- 93% explained the term letter; 93% stated an example; and 87% recognized an example. Thus, the kindergarteners' performances did not reflect the difficulty level of the tasks.

When the percentages of successful performances for the term letter were organized according to the reading abilities of the children, the inverse relationship generally held (Table 3.53). Increasingly, more non-readiness children were correct as the difficulty of the task decreased, although the difference between the explanation task and the statement of an example task was small. Fifty-four percent of the non-readiness children explained the term letter; 62% stated an example; and 85% recognized an example. Increasingly more readers were correct as the difficulty of the task decreased, although little difference occurred between the statement of an example task and the recognition of an example task. Sixty-one percent of the readers explained the term letter; 83% stated an example; and 89% recognized an example. The percentage of successful performances by readiness children did not increase as the difficulty of the task decreased. The differences among

the percentages were small, since 86% of the readiness children explained the term letter; 93% stated an example; and 86% recognized an example.

Table 3.53

A COMPARISON OF THE CORRECT PERFORMANCES BY CHILDREN WITH DIFFERENT READING ABILITIES ON THE READING TERMINOLOGY TASKS FOR THE TERM LETTER

| Tasks | Reading Abilities: Non-readiness (n=13) # | % | Readiness (n=14) # | % | Reader (n=18) # | % |
|---|---|---|---|---|---|---|
| Explain term | 7 | 54 | 12 | 86 | 11 | 61 |
| State an example | 8 | 62 | 13 | 93 | 15 | 83 |
| Recognize an example | 11 | 85 | 12 | 86 | 16 | 89 |

Thus, for the term letter, increasingly more children in the total sample, in the first grade and pre-school grade levels, and in the reader and non-readiness reading abilities were correct as the difficulty of the tasks decreased. The percentages of kindergarten children and readiness children who performed correctly remained similar as the difficulty of the tasks decreased.

Only two studies (Downing, 1969-70, 1970, 1971-72; Francis, 1973) addressed the issue that task requirements might induce different performances and consequently in-

fluence the conclusions regarding the children's understanding. Francis (1973) found no difference between the performances on a recognition task and an explanation task. In the current study, the results of the kindergarteners' and readiness children's performances support Francis' results. But the majority of the results in the current study concur with Downing's(1969-70, 1970, 1971-72) findings that the children could complete the recognition task successfully but not necessarily be able to verbalize about the terms. The total sample results, the first grade and pre-school grade level results, and the reader and non-readiness reading ability results support Downing's findings. Task requirements influenced the children's performances. More children performed correctly as the difficulty of the task decreased.

Results relative to the term "word". Table 3.54 presents the percentage of children in each grade level who correctly performed each task for the term word. Increasingly more children in the total sample performed correctly as the difficulty of the task decreased. Forty-one percent of the total sample explained the term word; 73% stated an example; and 80% recognized an example.

Within the grade levels, the percentage of correct performances tended to increase as the task difficulty decreased. Increasingly more first graders were correct but little difference occurred between the percentages of first

Table 3.54

A COMPARISON OF THE CORRECT PERFORMANCES BY CHILDREN IN DIFFERENT GRADE LEVELS ON THE READING TERMINOLOGY TASKS FOR THE TERM WORD

| Tasks | Grade Levels[a] Pre-school # | % | Kindergarten # | % | First Grade # | % | Total[b] # | % |
|---|---|---|---|---|---|---|---|---|
| Explain term | 6 | 40 | 7 | 47 | 9 | 60 | 22 | 41 |
| State an example | 9 | 60 | 10 | 67 | 14 | 93 | 33 | 73 |
| Recognize an example | 9 | 60 | 12 | 80 | 15 | 100 | 36 | 80 |

[a] n=15

[b] N=45

graders who stated an example and who recognized an example. Sixty percent of the first graders explained the term word; 93% stated an example; and 100% recognized an example. The kindergarteners' percentages illustrated the inverse progression. Forty-seven percent of the kindergarteners explained the term word; 67% stated an example; and 80% recognized an example. The difference in the percentages of the pre-schoolers' correct performances occurred between the explanation task and the other two tasks. Forty percent of the pre-schoolers explained the term word, while 60% stated an example and recognized an example.

When the percentages of successful performances for the term word were organized according to the reading abili-

ties of the children, the inverse relationship generally held (Table 3.55). Increasingly more readers were correct as the difficulty of the task decreased. Sixty-one percent of the readers explained the term word; 83% stated an example; and 94% recognized an example. Increasingly more readiness children were correct as the difficulty of the task decreased. Forty-three percent of the readiness children explained the term word; 64% stated an example; and 86% recognized an example. The inverse progression did not occur with the non-readiness children's correct performance percentages. Thirty-eight percent of the non-readiness children explained the term word; 69% stated an example; but only 54% recognized an example.

Table 3.55

A COMPARISON OF THE CORRECT PERFORMANCES BY CHILDREN WITH DIFFERENT READING ABILITIES ON THE READING TERMINOLOGY TASKS FOR THE TERM WORD

| | Reading Abilities | | | | | |
|---|---|---|---|---|---|---|
| | Non-readiness (n=13) | | Readiness (n=14) | | Reader (n=18) | |
| Tasks | # | % | # | % | # | % |
| Explain term | 5 | 38 | 6 | 43 | 11 | 61 |
| State an example | 9 | 69 | 9 | 64 | 15 | 83 |
| Recognize an example | 7 | 54 | 12 | 86 | 17 | 94 |

Thus, for the term word, increasingly more children were correct as the difficulty of the task decreased, confirming Downing's (1969-70, 1970, 1971-72) findings. The inverse relationship occurred when the explanation and recognition performances of the total sample, of each grade level, and of the reader and readiness reading abilities were compared. A comparison of the statement of an example task and the recognition task produced small differences in the percentages of correct performances for the total sample, the first grade group, the reader and non-readiness groups. The percentages of pre-schoolers who performed correctly on the statement and recognition tasks were equal. Thus, the statement task for the term word seemed to be of intermediate difficulty, technically, but of similar difficulty to the recognition task, practically. The non-readiness children's performance percentages formed a unique progression (explanation, recognition, statement). Since the differences among the percentages for the non-readiness group were small, the results could indicate agreement with Francis' (1973) findings of no difference.

Results relating to the term sentence. As presented in Table 3.56, the percentage of children in the total sample who correctly performed the sentence tasks increased as the difficulty of the task decreased. Sixteen percent of the total sample explained the term sentence; 22% stated an example; and 44% recognized an example.

Table 3.56

A COMPARISON OF THE CORRECT PERFORMANCES BY CHILDREN IN DIFFERENT GRADE LEVELS ON THE READING TERMINOLOGY TASKS FOR THE TERM SENTENCE

| Tasks | Grade Levels[a] | | | | | | Total[b] | |
|---|---|---|---|---|---|---|---|---|
| | Pre-school | | Kindergarten | | First Grade | | | |
| | # | % | # | % | # | % | # | % |
| Explain term | 1 | 7 | 0 | 0 | 6 | 40 | 7 | 16 |
| State an example | 0 | 0 | 0 | 0 | 10 | 67 | 10 | 22 |
| Recognize an example | 6 | 40 | 3 | 20 | 10 | 67 | 20 | 44 |

[a] n=15

[b] N=45

First graders performed differently than the pre-schoolers or the kindergarteners on the three tasks for the term sentence. More first graders than children in the other grade levels completed the three tasks. The first graders successfully completed the statement and recognition tasks more often than the explanation task. Forty percent of the first graders explained the term sentence; 67% stated an example; and 67% recognized an example.

In contrast, the recognition task was the only task completed successfully by 40% of the pre-schoolers and 20% of the kindergarteners. No one in either group stated an example. Only one pre-schooler explained the term.

Therefore, the pre-schoolers and kindergarteners could only recognize an example successfully. The first graders were more successful at all the tasks, and found the recognition and statement tasks easier than the explanation task. Consequently, the inverse relationship held for all grade levels, although the pattern of correct performances was different. Increasingly more children performed correctly as the task difficulty decreased.

When the percentages for correct performances with the term sentence were organized according to the reading abilities of the children, the inverse relationship generally held (Table 3.57). Increasingly more readers were correct as the difficulty of the task decreased. Thirty-three percent of the readers explained the term sentence; 50% stated an example; and 61% recognized an example. While more readiness children (29%) recognized an example of the term sentence than successfully completed the two other tasks, no difference occurred between the percentage of children who explained the term and who stated an example (7% for both tasks). Similarly, more non-readiness children recognized an example of the term sentence (31%), since no one completed the explanation or statement tasks.

Thus, for the term sentence, increasingly more children were correct as the difficulty of the task decreased, supporting Downing's (1969-70, 1970, 1971-72) results. The progression among the three tasks held when the percen-

Table 3.57

A COMPARISON OF THE CORRECT PERFORMANCES BY CHILDREN WITH DIFFERENT READING ABILITIES ON THE READING TERMINOLOGY TASKS FOR THE TERM SENTENCE

| Tasks | Reading Abilities | | | | | |
|---|---|---|---|---|---|---|
| | Non-readiness (n=13) | | Readiness (n=14) | | Reader (n=18) | |
| | # | % | # | % | # | % |
| Explain term | 0 | 0 | 1 | 7 | 6 | 33 |
| State an example | 0 | 0 | 1 | 7 | 9 | 50 |
| Recognize an example | 4 | 31 | 4 | 29 | 11 | 61 |

tages for the total sample and for the readers were compared. When the percentages for each grade level and the readiness and non-readiness reading abilities were compared, the inverse relationship held for the most difficult task, explanation of the term, and the easiest task, recognition of the term. The statement task generally occupied an intermediate position but the exact pattern varied. The first graders' percentages were equal on the statement and recognition tasks. The kindergarteners', readiness children's and non-readiness children's percentages were equal on the explanation and the statement tasks. The pre-schoolers' percentages exhibited small differences on the two tasks. The different patterns of the statement task reflected the ability of the first graders to complete the tasks and the

inability of the other two groups. Thus, the statement task generally occupied an intermediate position.

Summary. The children's performances on the recognition tasks were not comparable to their performances on the explanation tasks. Increasingly more children were correct as the difficulty of the task decreased. The specific term involved in the task influenced the percentage of correct performances but the inverse relationship held. The grade levels and reading abilities of the children were reflected in the percentage of correct performances but the inverse relationship generally held. Therefore, the following results can be stated:

1. Increasingly more children were correct as the difficulty of the task decreased.

2. The explanation of the term was the most difficult task for all three terms.

3. The recognition of an example of the term was the easiest task for all three terms.

4. Although the amount of difference between the statement task and the explanation task, and the amount of difference between the statement task and the recognition task varied according to the term in question, and the grade level or reading ability of the children, the statement of an example was a task of intermediate difficulty.

5. Although the term letter was the easiest term to explain, to state an example, and to recognize an example, increasingly more children were correct as the difficulty of the task decreased.

6. Although the term word was of intermediate difficulty to explain, to state an example and to recognize an example, increasingly more children were correct as the difficulty of the task decreased.

7. Although the term sentence, was the most difficult term to explain, to state an example. and to recognize an example, increasingly more children were correct as the difficulty of the task decreased.

8. The inverse relationship was most apparent for the total sample percentages.

9. The relationship held for the percentages of first graders' and readers' correct performances.

10. For all terms, the relationship did not hold for the other two grade levels and reading abilities.

Research Question 5: Are the pre-schoolers', kindergarteners', and first graders' respective performances on the segmentation tasks similar to the pre-schoolers', kindergarteners', and first graders' respective performances on the comprehension of reading terminology tasks?

The fifth question was posed to compare the children's performances on the segmentation and terminology tasks. The related research proported to measure children's metalinguistic understanding of a word. But the respective segmentation tasks and terminology tasks seemed to require different skills for the successful demonstration of metalinguistic understanding. The segmentation tasks required the child to operate visually and aurally on sentential language. In the visual context, the child seemed to need to recognize the function of the spaces as she divided the print into words. Once the cue of space was recognized, the child completed the task. In the aural context, the child seemed to need to adopt an unique stress pattern for the sentence as she successfully divided the aural sentence into words. The child who altered her stress pattern concurrently

divided the sentence into words. The comprehension of reading terminology tasks required the child to examine the terms used in reading instruction. The recognition task required the child to select an isolated example of a term from a given array. The explanation task required the child to verbalize a definition for the term. The hypothesized different requirements of the respective tasks may be reflected in the number and percentage of children who successfully completed the respective tasks.

Through Research Question 4, the different requirements of the two tasks in the comprehension of reading terminology -- the recognition task and the explanation task -- were investigated by comparing the percentage of children who successfully completed the two tasks. The recognition task was found to be completed by a higher percentage of children than the explanation task. The specific term involved did influence the percentage of correct performances but the inverse relationship between task difficulty and percentage of correct performances held. Thus, Research Question 5 extends Research Question 4 by comparing the percentage of correct performances on the segmentation task to the percentage of correct performances on the two reading terminology tasks.

To provide guidelines for the relative comparison, the terms easy, intermediate and difficult were defined in the following manner:

1. A task was considered difficult if 0% to 40% of the children in the grade level successfully completed the task.

2. A task was considered of intermediate difficulty if 41% to 70% of the children in the grade level successfully completed the task.

3. A task was considered easy if 71% to 100% of the children in the grade level successfully completed the task.

The number and the percentages of children who performed correctly on the segmentation tasks and on the terminology tasks are presented in Table 3.58. In general, the recognition tasks, especially for the terms letter and word, were the easiest for most grade levels and the total sample. The explanation task for the term sentence was the most difficult for all grade levels and the total sample. The segmentation tasks, the letter and word explanation tasks, and the sentence recognition task were of intermediate difficulty. The exact degree of difficulty depended on the specific grade level in question.

The percentages of correct performances for the total sample conformed to the general pattern. The recognition tasks for the terms letter and word were the easiest. Eighty-seven percent of the total sample performed correctly on the letter recognition task and 80% on the word recognition task. The explanation task for the term sentence was the most difficult task, since only 16% of the total sample performed correctly. The remaining taks were of intermediate difficulty. Sixty-seven percent of the total sample

Table 3.58

A COMPARISON OF THE CORRECT PERFORMANCES BY CHILDREN IN DIFFERENT GRADE LEVELS ON THE SEGMENTATION TASKS AND THE TERMINOLOGY TASKS

| Tasks | Grade Levels[a] Pre-school # | % | Kindergarten # | % | First Grade # | % | Total[b] # | % |
|---|---|---|---|---|---|---|---|---|
| Segmentation | | | | | | | | |
| Aural[c] | 3 | 20 | 3 | 20 | 14 | 93 | 20 | 44 |
| Visual[c] | 6 | 40 | 8 | 53 | 14 | 93 | 28 | 62 |
| Terminology | | | | | | | | |
| Explanation | | | | | | | | |
| Letter | 7 | 47 | 14 | 93 | 9 | 60 | 30 | 67 |
| Word | 6 | 40 | 7 | 47 | 9 | 60 | 22 | 49 |
| Sentence | 1 | 7 | 0 | 0 | 6 | 40 | 7 | 16 |
| Recognition | | | | | | | | |
| Letter | 11 | 73 | 13 | 87 | 15 | 100 | 39 | 87 |
| Word | 9 | 60 | 12 | 80 | 15 | 100 | 36 | 80 |
| Sentence | 6 | 40 | 3 | 20 | 10 | 67 | 19 | 42 |

[a] n=15

[b] N=45

[c] 80% correct was considered mastery performance.

were correct on the letter explanation task; 62% on the visual segmentation task; 49% on the word explanation task; 44% on the aural segmentation task; and 42% on the sentence recognition task.

Thus, for the total sample, a progression of task difficulty can be stated. The easiest task involved the easy terms -- letter and word -- and the recognition task. The intermediate difficulty tasks were the segmentation tasks,

the explanation tasks involving the easy terms, and the recognition task involving the most difficult term -- sentence. The most difficult task involved both the most difficult term -- sentence -- and the most difficult task -- explanation.

The percentages of correct performances by the first graders followed the general pattern. The letter and word recognition tasks were successfully completed by all first graders (100%), and thus were the easiest tasks. The visual and aural segmentation tasks were also easy, since 93% of the first graders successfully mastered both tasks. The sentence recognition task, and the letter and word explanation tasks were of intermediate difficulty. Sixty-seven percent of the first graders successfully performed the sentence recognition task. Sixty percent of the first graders correctly performed the letter and word explanation tasks. The most difficult task was the sentence explanation task, since only 40% of the first graders correctly performed the task.

Therefore, the task difficulty for the first graders generally proceeded from the easy recognition task and the segmentation tasks to the difficult explanation tasks. All of the recognition tasks were successfully performed by at least two-thirds of the first graders. The tasks of intermediate difficulty involved either a hard term (sentence recognition) or a hard task (letter and word explanation). The sentence explanation task involving both a hard term and task was the only task on which less than half of the first graders performed correctly.

The kindergarteners' correct performances seemed to be influenced by the specific term involved in the task. The letter explanation task was the easiest, since 93% of the kindergarteners performed correctly on the task. Since 87% of the kindergarteners were correct on the letter recognition task and 80% were correct on the word recognition task, these tasks were classified as easy also. The visual segmentation task and the word explanation task were considered of intermediate difficulty, since 53% and 47%, respectively, performed correctly on the tasks. The aural segmentation task and the sentence recognition task were difficult, since only 20% of the kindergarteners correctly performed both tasks. The sentence explanation task was the most difficult, since no kindergartener successfully completed the task.

Thus, the easiest tasks for the kindergarteners were the letter tasks -- both the letter explanation task and the letter recognition task. The tasks of intermediate difficulty were the visual segmentation task and the word explanation task. The most difficult tasks were the aural segmentation task and the sentence tasks -- both recognition and explanation. Thus, the term involved in the task seemed to influence the kindergarteners' performance more than the task requirements. The difficulty of the segmentation tasks reflected the stability of the respective cues which were hypothetically used for successful completion. The more stable space cue was reflected in the position of inter-

mediate difficulty for the visual segmentation task, while the unstable intonation cue for the aural segmentation task was reflected in the position of very difficult.

The pre-schoolers' percentages of correct performances followed the general pattern. The easiest task was the letter recognition task, since 73% of the pre-schoolers were correct on the task. The word recognition task (60% of the pre-schoolers were correct) and the letter explanation task (47% of the pre-schoolers were correct) were of intermediate difficulty. The visual segmentation task, the word explanation task, and the sentence recognition task were categorized as difficult, since only 40% of the pre-schoolers were correct. The most difficult tasks were the aural segmentation task (20% of the pre-schoolers achieved mastery) and the sentence explanation task (7% of the pre-schoolers were correct).

Thus, the recognition task involving the easiest term -- letter -- was the easiest task for the pre-schoolers. Of intermediate difficulty were the word recognition task (involving an easy task) and the letter explanation task (involving an easy term). The remaining tasks were all quite difficult for the pre-schoolers. Again, the most difficult task was the sentence explanation task, which involved both the hardest term and the hardest task.

When the data were reorganized according to the children's reading abilities, the order of task difficulty did

not change (Table 3.59). The recognition task was again categorized as the easiest task. The segmentation task became progressively easier as children of higher reading abilities perofrmed and therefore was considered of intermediate difficulty. The sentence explanation task remained categorized as the most difficult task.

Table 3.59

A COMPARISON OF THE CORRECT PERFORMANCES OF CHILDREN WITH DIFFERENT READING ABILITIES ON THE SEGMENTATION TASKS AND THE TERMINOLOGY TASKS

| Tasks | Reading Abilities: Non-readiness (n=13) # | % | Readiness (n=14) # | % | Reader (n=18) # | % |
|---|---|---|---|---|---|---|
| Segmentation | | | | | | |
| Aural[a] | 1 | 8 | 4 | 29 | 15 | 83 |
| Visual[a] | 3 | 23 | 8 | 57 | 17 | 94 |
| Terminology | | | | | | |
| Explanation | | | | | | |
| Letter | 7 | 54 | 12 | 86 | 11 | 61 |
| Word | 5 | 38 | 6 | 43 | 11 | 61 |
| Sentence | 0 | 0 | 1 | 7 | 6 | 33 |
| Recognition | | | | | | |
| Letter | 11 | 85 | 12 | 86 | 16 | 89 |
| Word | 7 | 54 | 12 | 86 | 17 | 94 |
| Sentence | 4 | 31 | 4 | 29 | 11 | 61 |

[a]80% correct was considered mastery performance.

The readers' correct performances followed the general pattern and the pattern of the first graders. The easiest tasks were the word recognition task and the visual segmenta-

tion task. Ninety-four percent of the readers were correct on each task. The letter recognition task and the aural segmentation task were also easy, since 89% and 83% of the readers, respectively, were correct. The sentence recognition task and the letter and word explanation tasks were of intermediate difficulty, since 61% of the readers performed correctly on the three tasks. The most difficult task was the sentence explanation task which only 33% of the readers completed correctly.

Thus, the order of task difficulty for the readers was the same as the order of task difficulty for the first graders. The recognition and segmentation tasks were the easiest. The sentence recogniton (involving a more difficult term) and the letter and word explanation tasks (involving a more difficult task) were of intermediate difficulty. The sentence explanation task (involving both a hard term and a hard task) was the most difficult.

The performances of the children classified as readiness in reading ability seemed to be influenced by the specific term involved in the task, as the kindergarteners were. The easiest tasks were the letter and word recognition tasks and the letter explanation task. Eighty-six percent of the readiness children performed correctly on the three tasks. Two tasks were of intermediate difficulty -- the visual segmentation task and the word explanation task. Fifty-seven percent of the readiness children

performed correctly on the visual segmentation task, and 43% of the readiness children performed correctly on the word explanation task. The sentence recognition task and the aural segmentation task were difficult, since only 29% of the readiness children successfully completed each task. The most difficult task was the sentence explanation task, which only 7% of the readiness children correctly performed.

Therefore, the order of task difficulty for the readiness children was similar to the order of difficulty for kindergarten children. The easiest tasks for the readiness children involved the easy terms (letter and word) and the easiest task mode (recognition) so that letter recognition, letter explanation, and word recognition were the three easiest tasks for the readiness children. The most difficult tasks were the aural segmentation task and the sentence tasks (both recognition and explanation). The visual segmentation task was of intermediate difficulty. Thus, the term involved seemed to have influenced readiness children's performances more than the task requirements.

The non-readiness children's performances indicated that most of the tasks were very difficult. The letter recognition task was the only easy task. Eighty-five percent of the non-readiness children performed correctly on the letter recognition task. Word recognition and letter explanation were of intermediate difficulty, since 54% of the non-readiness children performed correctly on each task. The word explanation task, the sentence recognition task

task and the visual segmentation task were difficult for the non-readiness children. Thirty-eight percent of the non-readiness children performed correctly on the word explanation task; 31% on the sentence recognition task; and 23% on the visual segmentation task. The most difficult tasks were the aural segmentation task (8% exhibited mastery) and the sentence explanation task (no one performed correctly).

Thus, the order of task difficulty for the non-readiness children was similar to the order of task difficulty for the pre-school children. The easiest task for the non-readiness children was the letter recognition task, which included both an easy term and an easy task. The letter explanation task (an easy term) and the word recognition task (an easy task) were of intermediate difficulty. The most difficult tasks were the word explanation task, the segmentation tasks, and the sentence tasks.

In summary, the children's performances on the segmentation tasks were not similar to their performances on the reading terminology tasks. In ascending sequence, the general order of difficulty was recognition tasks, segmentation tasks, and explanation tasks. The general order of difficulty was altered only slightly when the performances by children in specific grade levels and reading abilities were examined. Therefore, after the comparison of performances on the reading terminology tasks and the segmentation tasks, the following results can be stated:

1. The comprehension of reading terminology tasks formed the end points in a sequence of relative task difficulty.

2. The recognition tasks were generally the easiest, reflecting the relatively simple task requirements of the selection of an isolated example from a given array.

3. The explanation tasks were generally the most difficult, reflecting the relative difficult task requirements of verbalizing, without aid, an explanation.

4. Taken together, the segmentation tasks averaged a position of intermediate difficulty. Taken separately, the visual segmentation task averaged a position of intermediate difficulty, while the aural segmentation task averaged a position of great difficulty.

5. For first graders, the recognition and segmentation tasks were the easiest, while the explanation tasks were the most difficult.

6. For kindergarteners, the specific term involved seemed to influence the performances. The letter tasks were the easiest and the sentence tasks were the most difficult. The kindergarteners found the visual segmentation task was of intermediate difficulty while the aural segmentation task was very difficult.

7. For pre-schoolers, the recognition taks were the easiest, while the sentence explanation task was the most difficult. The pre-schoolers found the segmentation task to be difficult, especially the aural segmentation task.

8. The order of task difficulty for readers was the same as the order of task difficulty for first graders.

9. Readiness children's performances and kindergarteners' performances formed the same order of difficulty and both were influenced by the term involved in the task.

10. Non-readiness children's and pre-schoolers' performances indicated that most of the tasks were difficult.

# CHAPTER FOUR

## SUMMARY, LIMIATIONS, CONCLUSIONS, AND IMPLICATIONS

Children's metalinguistic ability is the focus of this investigation. The development of children's concious use of language has been examined through children's performances on linguistic segmentation tasks and on understanding of reading terminology tasks. A summary of the investigation is presented in this chapter. In formulating generalizations from the results of the study, the limitations inherent in the study must be taken into account. Therefore, the limitations of this study are discussed first and then conclusions are presented. Finally, implications for teaching and research are suggested.

### Summary

Children, upon entrance into school, are confronted with reading lessons given by teachers who assume that they are able to analyze language objectively. But prior to reading or schooling, children primarily use language functionally. Children slowly become aware that they are hearing and speaking with an entity called language. With

the onset of reading instruction, the children must become conscious of language as an entity which can be analyzed. In reading lessons, the teacher requires that the children analyze language. He refers to language by using technical terms -- letter, word, sentence. He asks the children to locate isolated examples of the terms and to locate examples which are embedded within the aural context or speech and within the visual context or print. Thus, the children's use of language must evolve from an unconscious, experiential use to a conscious, metalinguistic use.

For this study, children's metalinguistic ability is defined in terms of two components of cognitive clarity -- the understanding of linguistic segments and the understanding of reading terminology. A review of the past research on these two components led to the conclusion that older children and readers were more metalinguistically aware than younger children and non-readers. But the review did not lead to a description of the development of metalinguistic ability. Therefore the basic question of this investigation is whether there are developmental trends in children's metalinguistic understanding of "word". And then, a secondary question is if there are developmental trends, can these trends, or differences in task performances, be accounted for. Specifically, developmental trends were sought in children's understanding of the linguistic segment "word" and in children's understanding of reading terminology.

As mentioned above, a review of the research related to children's understanding of linguistic segments led to only one conclusion -- older children or readers were more metalinguistically aware than younger children or non-readers. This conclusion was predominantly supported by research on children's understanding when an aural context was presented. Although Karpova (1955), Holden (1972), and Ehri (1975) presented different tasks to different aged children, the success of the older children was repeatedly demonstrated. The researchers who used the visual context included only first graders in their studies (Meltzer and Herse, 1969; Michish, 1974) so that no relationship between grade level and performance could be concluded. In the paired aural-visual context research (Holden and MacGinitie, 1972; Figa, 1972; McNinch, 1974) children in different grade levels performed on tasks involving both contexts. But since Holden and MacGinitie's study and McNinch's study were fraught with methodological problems, no conclusion regarding grade level and performance can be stated. In Figa's study (1972), only first graders were involved so that again no relationship between grade level and performances can be stated. Thus on the basis of the conclusion from the aural context research, the expectation was that the oldest children in the current study would exhibit the most success on the segmentation tasks which were used to assess their understanding of the linguistic segment "word". Therefore,

Research Hypothesis 1 stated that children in increasing grade levels (pre-school, kindergarten, first grade) will exhibit increasing proficiency in their performances on the segmentation tasks.

The research was reviewed to ascertain what the relationship was between performances with the aural context and performances with the visual context. The researchers investigating only the aural context or only the visual context used different tasks so that no conclusion could be drawn. In the paired aural-visual context research, tasks with both contexts were included in each study but Holden and MacGinitie (1972) and McNinch (1974) used incomparable tasks and poor methodology in their research. Because the two studies were poorly designed, no conclusion could be drawn. Since Figa's study (1972) found no consistent relationship, no prediction regarding performances with the aural context and performances with the visual context was made. Therefore, Research Hypothesis 2 stated that the children's performances on the segmentation tasks would not differ significantly with the presentation of the segmentation task in the aural or visual context.

Similarly, the research was reviewed for information regarding an interaction between grade level and context. Since incomparable tasks were used in the past research and since the grade level range included in most of the past research was either small or non-existent, an interaction

effect could not be supported. Therefore, none was predicted and a hypothesis of no difference was formulated. The grade levels of the children (pre-school, kindergarten, first grade) will have no differential effect on the performances of the segmentation tasks in the aural and visual contexts.

As stated above, the review of the literature related to children's understanding of linguistic segments led to the conclusion that readers (or older children) were more successful on the metalinguistic tasks than were non-readers (or younger children). Two studies (Holden, 1972; and Ehri, 1975) investigated the relationship between reading ability and understanding of linguistic segments in the aural context. They both found that readers were more successful on their respective tasks than non-readers. Therefore, a prediction was made in the form of Research Hypothesis 4: children with increasing reading abilities (non-readiness, readiness, reader) will exhibit increasing proficiency in their ability to segment words. Since in only two studies were children identified as readers or non-readers, and since, as stated above, no conclusion regarding the interaction between grade level and context could be drawn from the previous research, no prediction was made regarding the interaction between reading ability and the context of the segmentation task. Therefore, Research Hypothesis 5 stated that the reading ability of the children (non-readiness, readiness, reader) will have no differential effect on the

performance of the segmentation tasks in the aural and visual contexts.

Using the above five research hypotheses, the total performance patterns on the segmentation tasks could be examined but error patterns which might exist within the total performances could not be examined. In a few studies (Meltzer and Herse, 1969; Karpova, 1955; Holden and MacGinitie, 1972), error patterns had been examined in order to investigate differences in performances. Therefore, the decision was made to examine the children's performances on the segmentation tasks to determine whether any systematic error patterns were present in the visual context and in the aural context. Research Question 1 reflected that decision: Is there a consistent, systematic error pattern in the performances of pre-school, kindergarten, and first grade children on the visual and aural segmentation tasks?

In summary, the five research hypotheses and the one research question stated above, were formulated to investigate the developmental trends in children's understanding of linguistic segments -- the first component of cognitive clarity. The second component of cognitive clarity -- children's understanding of reading terminology -- was investigated through three research questions, which are stated below.

A review of the literature related to children's understanding of reading terminology led to the conclusion

that after the first year of school, the children understood the technical terms of reading better than when they began school (Reid, 1966; Downing, 1969-70, 1970, 1971-72; Francis, 1973). But the research differed as to whether all children had mastered all of the terms by the end of the first school year. The lack of agreement in the conclusions can be accounted for by the different grade levels of the children, the different reading abilities of the children, the different terms involved (letter, word, sentence), and the different tasks used to assess understanding. Therefore, three research questions concerning the children's understanding of the reading terms -- letter, word, sentence -- were posed so that the effects of different grade levels, different reading abilities, and different tasks could be investigated. The first research question was concerned with whether the children's understanding of the terms letter, word, sentence, as demonstrated by their performances on an explanation task, would be reflective of their respective grade levels and/or reading abilities. Because the general conclusion was that older children and more able children performed better, it was expected that the older children and the readers in the current study would be able to explain the three terms more successfully than younger, non-reading children. But no prediction was made in regard to whether all three terms (letter, word, sentence) would be explained or not. The explanation task was con-

sidered a difficult task through which to communicate understanding, since an original statement had to be made by the child without any cues from the experimenter. Children may understand the term but not be able to verbalize a definition and so appear to not comprehend the term. Thus, the use of the explanation task to assess understanding of the terms was expected to limit who could demonstrate understanding.

As a consequence of the above expectation, a second research question was formulated to examine the children's ability to express their understanding of the terms through a recognition task which would require only comprehension of the term and not verbalization ability. The research question asked whether the children's understanding of the reading terms (letter, word, sentence), as demonstrated by their performances on a recognition task, were reflective of their grade levels and reading abilities. It was expected that, since the recognition task would be easier than the explanation task, more children and younger, less able children would demonstrate an understanding of the terms. The differing task requirements led to the third research question which asked whether the children's performances on the explanation task were comparable to their respective performances on the recognition task. It was expected that their respective performances would not be comparable and that more children would be successful with

the easier recognition task than with the difficult explanation task. Thus, three research questions were formulated to investigate developmental trends in children's understanding of reading terminology.

Since the investigation involved two definitions of metalinguistic ability -- the understanding of linguistic segments and the comprehension of reading terminology -- and since the related tasks -- the segmentation tasks and the reading terminology tasks -- seemed to require different abilities for successful completion, a final research question was posed: Are the children's performances on the segmentation tasks similar to their respective performances on the comprehension of reading terminology tasks?

In summary, the primary purpose of the current study was to answer the following questions: Are there developmental trends in young children's metalinguistic understanding? And, if there are, how are the trends accounted for? Research Hypotheses relating to the children's understanding of linguistic segments were formulated. Research Questions were formulated to examine error patterns on the segmentation tasks and to examine the children's comprehension of reading terminology. Research Questions were formulated to compare the children's performances on the two reading terminology tasks, and to compare the children's performances on all of the metalinguistic tasks.

The methods used to investigate the Research Hypotheses

and the Research Questions involved the location of subjects who could be described as differing in development, the designing of comparable materials and similar procedures for the segmentation tasks, and the adaptation of materials and procedures for the reading terminology tasks. The data analysis which were selected varied with the specific requirements of the Research Hypotheses and the Research Questions. Therefore, the data analysis methods will be summarized when the specific results are presented. A summary of the subjects, materials and procedures used follows.

Since a central concern of the current study was a description of development, the subjects included in the study needed to be children in different stages of development. The decision was made to use grade level as one method of defining different stages. Therefore, 15 children from each grade level (pre-school, kindergarten, first grade) were randomly selected from the school population in a small, rural-suburban town in central Wisconsin. The total sample was composed of 45 children. Since, in the past research, readers had been found to be more metalinguistically advanced than non-readers, reading ability was also used to define different stages of development. The 45 children were reclassified according to their reading ability (non-readiness, readiness, reader) which was determined by an informal procedure used by Harty (1975) and by Durkin (1966).

The reclassification of the total sample resulted in 13 children designated as non-readiness in reading ability, 14 children as readiness, and 18 children as readers. Thus, the development of metalinguistic ability in the current study was described by comparing the performances of children in three grade levels (pre-school, kindergarten, first grade) and by comparing the performances of children in three reading ability groups (non-readiness, readiness, reader) when metalinguistic tasks were presented.

The metalinguistic tasks which were included in the present study can be categorized into two types. First, the segmentation tasks were used to assess the children's understanding of the linguistic segment "word". The children were required to separate each word from the aural context and from the visual context in which the words were embedded. Second, the comprehension of reading terminology tasks were used to assess the children's understanding of the terms letter, word, and sentence. On the explanation task, the children were required to define, without aid, each of the terms. On the recognition task, the children were required to select examples of the three terms from a given array. The children were interviewed individually and presented the metalinguistic tasks in the following order: (1) the explanation of reading terminology task, (2) the recognition of reading terminology task, (3) the first segmentation task, (4) the procedure to determine reading ability and (5)

the second segmentation task. The explanation task was presented first so that the statements would be original and not influenced by performances on the other metalinguistic tasks. One half of the sample was presented the aural context segmentation task first and the other half the visual context first to balance any order effects. The procedure to determine reading ability was done after the first segmentation task to provide some distraction before the segmentation task was repeated in the other context.

The materials and procedures used in the segmentation tasks were designed to be comparable in both the aural context and the visual context so that performances with the two contexts could be compared. Thus, for the segmentation tasks, five different types of sentences -- command, subject verb, subject verb object, subject verb complement, and subject verb object object -- were written so that the sentences varied in length by two words. The lexical items were familiar words which varied in the number of syllables (one to three) and in their visual configurations (ascending and descending letters, long and short words). To balance the lexical items, two sentences for four types (command, subject verb, subject verb complement, subject verb object) and three sentences for the subject verb object object type were written to form the eleven test sentences. The sentences were judged by reading experts to resemble basal reading materials. For the aural context, four tapes of

two practice sentences and then the eleven, randomly ordered, test sentences were recorded. One of the four tapes was randomly selected for the aural context task for each child. For the visual context, each sentence was printed in primary type on an 8½ x 2½ strip of paper. The eleven test sentences were randomly collated and stapled after the two practice sentences. The particular set of sentences for the visual context was randomly selected for each child.

The procedures for the segmentation tasks were adapted from past research. For the aural context, Karpova's (1955) task was altered to include the following steps: (1) the child heard a tape recording of the sentence; (2) the child repeated the sentence; (3) the child simultaneously knocked with a fist as she said each word in the sentence. The experimenter played the next sentence after the child had completed the three steps with the previous sentence. For the visual context, Meltzer and Herse's (1969) procedures were adopted. Using a crayon, the child circled each word in the sentence. The experimenter collected each strip of paper before presenting the next one.

The materials and procedures used for the comprehension of reading terminology tasks were also adapted from past research (Downing, 1969-70, 1970, 1971-72; Francis, 1973). For the explanation task, the following set of questions were asked about each of the terms -- letter, word and sentence: What is a (letter)? How do we use

(letters)? Tell me any (letter) you know. When the experimenter questioned each child, the presentation order of the three terms was random. For the recognition task, two examples for each term (letter, word and sentence) were randomly selected. Examples for the term number were also randomly selected because numbers and letters were confused on previous studies (Downing, 1969-70, 1970, 1971-72; Reid, 1966). The recognition array consisted of the following examples printed on separate index cards: (1) letter -- m, f; (2) word -- never, there; (3) sentence -- The children run., The girl is going home.; (4) number -- 3, 6. The experimenter randomly laid the eight cards in front of the child and requested the child to "Point to a card with just one (letter) on it." After each selection by the child, the cards were shuffled and randomly arranged for the next request. The order of the requests was random for each child.

As stated above, different types of data analyses were used depending upon specific requirements of the research hypotheses and the research questions. Therefore, each research hypothesis or question is presented; the respective analysis method used is reported, and then the related results are summarized.

The five Research Hypotheses investigated children's metalinguistic understanding using the aural and visual segmentation tasks. On the segmentation tasks, the children

were to knock for each word in the aural context and to circle each word in the visual context. The responses were designated as correct if the child divided the words at the appropriate potential pauses and spaces. The number of correct responses on the aural context were summed for the aural context score and the number of correct responses on the visual context were summed for the visual context score. The aural context score and the visual context score were added together for the total segmentation task score. These three scores were the data used to test the five Research Hypotheses concerning the children's understanding of linguistic segments.

The Research Hypotheses One through Three were tested using a Split-Plot ANOVA (Kirk, 1968). Because repeated measures occurred in the context treatment, the Geisser-Greenhouse conservative F-test (Kirk, 1968, pp. 142-143) was used to test for significance.

Research Hypotheses 1 stated the prediction that pre-schoolers, kindergarteners, and first graders would exhibit increasing proficiency in their aiblity to segment words. This research hypothesis was tested through two planned comparisons using an F ratio procedure (Kirk, 1968) with the significance level set at $< .05$. A significant difference was found between the proficiency of first graders and kindergarteners as compared to pre-schoolers in their ability to segment words at the appropriate potential

pauses and spaces ($p < .01$). Also, the difference between the proficiency of first graders as compared to kindergarteners in their ability to segment words was found to be significant ($p < .01$). Consequently, the two statistical hypotheses of no difference stated in terms of the planned comparisons were rejected. The prediction in the Research Hypothesis 1 had occurred. Pre-schoolers, kindergarteners, and first graders did exhibit increasing proficiency in their ability to segment words at their appropriate potential pauses and spaces.

Since no prediction could be made about the context effects or interaction effects, research hypotheses of no difference were translated into statistical hypotheses of no difference. Research Hypothesis 2 stated that performance on the segmentation tasks would not differ significantly with the presentation of the segmentation task in an aural or visual context. When the ANOVA was used to test for significance, the result was that the difference in the mean performance scores of the aural and visual contexts was not significant. Therefore, the statistical and research hypotheses concerning the effects of context were not rejected. The children's performances with the aural context were not signficantly different from their performances with the visual context.

Research Hypothesis 3 stated that the grade levels of the children (pre-school, kindergarten, first grade) would

have no differential effect on the performance of the segmentation tasks in the aural and visual contexts. The research hypothesis was tested through an identical statistical hypothesis stating no interaction effect between grade level and context. Interaction did occur -- first graders performed better on the visual context and preschoolers performed better on the aural context -- but the difference was not significant. Thus, the statistical and research hypotheses were not rejected. The performances by children in different grade levels were not significantly different when the aural context or the visual context of segmentation tasks were presented.

With Research Hypothesis 4, the prediction was made that children with increasing reading abilities (nonreadiness, readiness, reader) will exhibit increasing proficiency in their ability to segment words as measured by the total number of words divided at their respective potential pauses and spaces. The hypothesis was tested through two planned comparisons using the Dunn procedure (Kirk, 1968) with the significance level set at .05. The unweighted means solution (Kirk, 1968, pp. 276-279) was used because unequal cells occurred when the children were reclassified by reading ability. Again the Geisser-Greenhouse conservative F-test was used because repeated measures occurred in the context treatment. The results were found to be significant. The difference in the pro-

ficiency of the readers and readiness children as compared to non-readiness children in their abilities to segment words was significant ($p < .01$). In addition, the difference in the proficiency of readers as compared to readiness children in their abilities to segment words was found to be significant ($p < .01$). Consequently, the statistical hypotheses of no difference stated in terms of planned comparisons were rejected. As predicted in Research Hypothesis 4, children with increasing reading abilities did exhibit increasing proficiency in their ability to segment words at the appropriate potential pauses and spaces.

No prediction was made concerning the interaction of reading ability and context. Thus, Research Hypothesis 5 translated into a statistical hypothesis of no difference: The reading ability of the children (non-readiness, readiness, reader) will have no differential effect on the performances of the segmentation tasks in the aural and visual context. The result was that a significant interaction effect was found ($p < .05$) in the overall $F$-test. Therefore, a post hoc analysis was done using Scheffe's Method (Kirk, 1968). Only the comparison which opposed the average difference of non-readiness children's performances with the aural and visual contexts to the average difference of the reader's performances with the contexts was found to be significant ($p < .05$). Thus, an interaction between reading ability and context did occur and the statistical

and research hypotheses were rejected. Non-readiness children's performances with the aural and visual contexts were different from readers' performances with the two contexts.

Thus, the results from the investigation regarding the five Research Hypotheses supported the conclusion from the previous research -- oldest children and readers were the most metalinguistically able. Furthermore, this investigation found gradations in the children's proficiency related to their grade levels and reading abilities. Thus, significant differences occurred in the increasing proficiency demonstrated by pre-schoolers, kindergarteners and first graders. Significant differences also occurred in the increasing proficiency demonstrated by non-readiness children, readiness children and readers. No context effect was found to be significant. Although differences among the performances, by children in different grade levels, with the aural and visual contexts occurred, the differences were not significant. The differences among the performances, by children with different reading abilities, with the aural and visual contexts were significant. Non-readiness children's performances with the two contexts were significantly different from reader's performances. Thus, an interaction effect between reading ability and context was found to be significant.

Since the above five Research Hypotheses were related only to total performances with the aural and visual segmen-

tation tasks, Research Question 1 was asked to determine whether there were systematic error patterns in the performances on the segmentation tasks. The performances with the segmentation tasks were analyzed in four different ways: (1) a general comparison of performances with the two contexts, (2) a categorization of errors on the visual context task, (3) a categorization of errors on the aural context task, and (4) an examination of task variables.

The general comparison of performances with the two contexts examined how successfully individual children had performed with the two contexts. When the criterion for successful performance was 100% accuracy, no child segmented correctly with the aural context only, while 18 children segmented correctly with the visual context only. When 80% mastery was the criterion for a successful performance, more children mastered both contexts or only the visual context than mastered only the aural context. More first graders mastered both contexts or only the visual context than did kindergarteners or pre-schoolers. More readers mastered both contexts or only the visual context than did readiness or non-readiness children.

The examination of the visual context errors resulted in a systematic categorization consisting of five types of visual context errors: (1) whole sentence errors, (2) individual letter errors, (3) "a" omission errors, (4) division errors, (5) combination errors. The first graders made

only two types of errors. One child committed only "a" omission errors and another child committed only individual letter errors. Kindergarteners and pre-schoolers, however, made every type of visual context error. The descending order of frequency for their error types was combination errors, whole sentence errors, individual letter errors, division errors, "a" omission errors, and idiosyncratic errors. The majority of division errors occurred at ascending (t) or descending (p) letters indicating that the children may have used configuration as a criterion for word boundary. When both division and combination errors were analyzed, it was found that an arbitrary length of 3, 4, or 5 letters may have been used as a criterion for word boundary.

The examination of the aural context errors resulted in three classification schemes but the classification schemes were not discrete categories as were the visual context error types. Consequently, some errors were accounted for by all three classification schemes, while other errors were accounted for by only one scheme. The stress error classification scheme accounted for more errors than the major constituent classification scheme or the functor inclusion classification scheme. Reflecting their general competency, first graders made fewer stress errors, major constituent errors and functor inclusion errors than pre-schoolers or kindergarteners did. Within

the stress error classification scheme, first graders' performances differed from the pre-schoolers' and kindergarteners'. First graders' stress errors occurred most often on syllables, while pre-schoolers' and kindergarteners' stress errors occurred most often on phrases. The syllable stress error was the only stress error which did not numerically decrease as higher grade levels were tested.

The last examination of the individual performances on the segmentation task concerned task variables which might have influenced the children's performances. The children's error patterns were examined in terms of three task variables -- sentence length, position in sentence, and sentence type. The analysis of the performances in regard to the sentence length task variable found that in general, the children committed fewer errors on the shorter sentences. However, a uniform pattern was not present with either context. Thus, the task variable of sentence length seemed to have influenced the children's performances. The examination of performances in regard to the position in sentence task variable found that, with the aural context, the children committed more errors (in descending order) at the end of an aural sentence, at the beginning, and at the middle. With the visual context, the children committed more errors (in descending order) at the end of the visual sentence, at the middle, and at the beginning. Thus, the children's performances with both contexts were mostly influenced by

the final position in the sentences. The analysis of the performances in regard to the sentence type task variable found that, when sentence length was held constant, the children's performances with different types of sentences did not differ substantially in either context. Thus, the task variable of sentence type did not seem to have influenced the children's performances. Therefore, the two task variables of sentence length and position in the sentence seemed to have influenced the children's performances.

Thus, when individual performances on the segmentation task (Research Question 1) were examined, systematic error patterns were found. When the individual performances were examined for mastery, the result was that the children mastered either both contexts or only the visual context. When visual context errors were analyzed, five discrete categories were found: (1) combination errors, (2) division errors, (3) whole sentence errors, (4) individual letter errors, and (5) "a" omission errors. When aural context errors were examined, the stress error classification scheme accounted for nearly all of the errors. And, when task variables were investigated, the variables of setnence length and position in the sentence seemed to have influenced the children's performances.

In summary, the five Research Hypotheses and the first Research Question were formulated to investigate children's understanding of the linguistic segment word. Significant

developmental differences were found in the proficiency of children in increasing grade levels (pre-school, kindergarten, first grade). Significant developmental differences were also found in the proficiency of children with increasing reading abilities (non-readiness, readiness, reader). An interaction effect between reading ability and context was found to be significant. And finally, the errors committed by the children could be systematically categorized.

Developmental trends in children's understanding of reading terminology were investigated through three research questions. First, Research Question 2 was asked to determine whether the children's abilities to explain the terminology of reading (letter, word, sentence) were reflective of the grade level and/or reading ability of the children. The children's answers to two questions about each term (What is a (letter)? How do we use (letters)?) were classified in three ways: (1) a correct explanation by adult, native speaker standards, (2) an incorrect explanation because the wrong term was used or the explanation for different term was substituted, (3) an incorrect explanation because a semantic interpretation of the term was given. The number and percentage of children whose responses were classified in the three categories were analyzed for differences in performances reflecting different grade levels, different reading abilities and different reading terms.

In general, the results indicated that the children's ability to explain the reading terms was related to the grade level of the children, the reading ability of the children, and the specific term in question. Specifically, the increasing order of difficulty of the terms was letter, word and sentence. The differences in the performances by children in increasing grade levels reinforced the hierarchial order of differences among the terms. More first graders and more kindergarteners explained the term letter than pre-schoolers. More first graders explained the term word than kindergarteners or pre-schoolers. Only first graders explained the term sentence. The differences in the performances by children of increasing reading abilities paralleled the differences in the performances of children in increasing grade levels. More readers and more readiness children explained the term letter than non-readiness children. More readers explained the term word than readiness or non-readiness children. Only readers explained the term sentence. An examination of the types of errors found that the majority of the errors involved the substitution of another term for the correct term. Errors were committed by first graders and readers indicating that learning, as measured by the explanation task, continued beyond the first year of reading lessons.

The second research question regarding children's understanding of reading terminology was Research Question 3

which queried whether the children's abilities to comprehend the terminology of reading (letter, word, sentence) on a recognition task were reflective of the grade level and/or the reading ability of the children. The children's selections when requested to point to an example of each term were categorized as either a correct or incorrect example of the term. The incorrect choices were analyzed to determine whether a pattern of errors existed. For each term, the proportion of correct responses for each grade level and the proportion for each reading ability was tested for significance by a chi-square test (Kirk, 1968). In general, the results indicated that the children performed well on the recognition task. The majority of the children in the total sample recognized correct examples of the terms letter and word. No differences among the performances by children in different grade levels when the data for the terms letter and word were tested were significant. Also, no differences among the performances by children with different reading abilities were significant when the data for the terms letter and word were tested. However, when data for the term sentence were tested, significantly more first graders recognized a correct example than kindergarteners and preschoolers ($p < .05$). Similarly, significantly more readers recognized a correct example of the term sentence than readiness and non-readiness children ($p < .05$). When the errors were examined, different patterns were found. The

errors relating to the term letter were either numbers or words. The errors relating to the term word were only letters. The first graders' and readers' errors for the term sentence were only words, while the children of other grade levels and other reading abilities responded randomly. Therefore, the results indicated that, when measured by a recognition task, the terminology of reading was learned by the end of the first year of reading lessons and two terms (letter and word) were learned before the first year.

And finally, the third question regarding children's understanding of reading terminology was Research Question 4 which compared the different task requirements of the recognition task to the different task requirements of the explanation task. Thus, Research Question 4 stated: Are pre-schoolers', kindergarteners', and first graders' performances on the recognition task comparable to the pre-schoolers', kindergarteners', and first graders' respective performances on the explanation task? The number and percentage of children in each grade level and in each reading ability group who performed correctly on the recognition task were compared to the respective number and percentage of children who performed successfully on the explanation task. In general, the results concurred with the prediction that more children would exhibit successful performances when the easier recognition task was presented than when the more difficult explanation task was. The explanation of the term was the more

difficult task for all three terms and the recognition of an example of the term was the easier task for all three terms. When the order of difficulty for the terms was considered, the inverse relationship held between task difficulty and proportion of successful performances. Thus, although the term letter was the easiest term to explain and to recognize, more children were correct on the recognition task than on the explanation task. And, although the term sentence was the most difficult term to explain and to recognize, more children were correct on the recognition task than on the explanation task. The inverse relationship between the difficulty of the task and the proportion of successful performances was most apparent for the total sample percentages. The inverse relationship was found for the percentages of first graders' correct performances and the percentages of readers' correct performances. For all terms, the inverse relationship did not hold for the other two grade levels or the other two reading abilities.

In summary, developmental trends in children's understanding of reading terminology were found. The children's ability to explain the terms (letter, word, sentence) improved as children in increasing grade levels were questioned and as children with increasing reading abilities were questioned. The children seemed to be learning the terms in the hierarchial order of letter, word, sentence.

When presented with the recognition task, the children demonstrated their understanding of the terms letter and word. Thus, no significant grade-level or reading ability differences were found for those terms. However, only first graders and only readers recognized examples of the term sentence. Thus, significant differences were found between first graders' performances as compared to pre-schoolers' or kindergarteners' performances. Significant differences were also found between readers' performances as compared to non-readiness children's or readiness children's performances. And finally, the different task requirements of the recognition task as compared to the explanation task were reflected in the number of successful performances on the respective tasks. More children were successful on the easier recognition task, regardless of the term in question, than on the more difficult explanation task.

Since developmental trends were sought regarding two components of cognitive clarity, the performances on the tasks related to the two components were compared. Research Question 5 asked whether the pre-schoolers', kindergarteners', and first graders' performances on the segmentation tasks were similar to their respective performances on the comprehension of reading terminology tasks. The proportion of correct performances on the segmentation tasks and the reading terminology tasks were compared within each grade level and each reading ability. The tasks were categorized

as difficult (0-40% of the children in the grade level were successful), as intermediate (41%-70% of the children in the grade level were successful) or as easy (71%-100% of the children in the grade level were successful). In general, the results were that the greatest proportion of successful performances were on the recognition task, followed in descending order by the segmentation tasks, and the explanation tasks. For each grade level, the highest proportion of correct performances occurred on the recognition task. Also, for each grade level, the lowest proportion of correct performances occurred on the explanation task. Taken together, the segmentation tasks averaged a position of intermediate difficulty. But taken separately, the visual segmentation task averaged a position of intermediate difficulty, while the aural segmentation task averaged a position of great difficulty. Within two grade levels, the proportion of successful performances reflected the general order of difficulty. For the first graders, the recognition task and the segmentation tasks were easy, while the explanation task was difficult. For the pre-schoolers, the recognition task was easy, while the sentence explanation task was the most difficult. The segmentation tasks were also difficult for the pre-schoolers, especially the aural segmentation task. For the kindergarteners, the specific term involved seemed to have influenced their performances. The letter tasks were the easiest and the

sentence tasks were the most difficult. The visual segmentation task was of intermediate difficulty for the kindergarteners, while the aural segmentation task was very difficult. Within each reading ability, the proportion of successful performances paralleled the results found within the grade levels. Thus, the order of task difficulties was the same for readers and first graders, for readiness children and kindergarteners, and for non-readiness children and pre-schoolers. Thus, the children's performances on the segmentation tasks were not similar to their respective performances on the comprehension of reading terminology tasks.

## Limitations

When considering the conclusions and implications of the investigation, the limitations inherent in the research design, the selection of the subjects, and the procedures should be taken into account. A cross-sectional research design was used to examine the development of young children's metalinguistic understanding of language. Inherent in the cross-sectional design is the assumption that inter-individual development will be paralleled by intra-individual development. Therefore, the researcher assumes that the pattern of development in children of different ages (inter-individual) would be the same as if she examined the development of one child as he proceeded through similar ages (intra-individual). But one individual's development

as he ages may exhibit a different pattern than the composite pattern from children of different ages. Consequently, the possibility of a difference between the inter-individual development described in this cross-sectional design study and the intra-individual development which would be described in a longitudinal design study is a limitation of the current research.

Since stages of development in metalinguistic ability were investigated in the current study, measures of different stages in development had to be defined. One definition used was grade level. Children usually begin the sequence of grade levels when their chronological age conforms to the entrance age required. Therefore, a classification of most children by grade level parallels a classification of the same children by chronological age. Consequently, performance differences cannot be attributed solely to differences in the amount of schooling (grade level), but also may be attributed to the amount of experience (chronological age). Furthermore, since children of the same age usually mature physically in the same pattern and at the same rate, children classified by differing ages would usually be the same children if they were classified by differing physical maturity stages. Thus, performance differences in metalinguistic tasks could be attributed to grade level differences, chronological age differences, physical maturity differences, or a combina-

tion thereof, since no one variable can be isolated from the others.

A second definition of developmental stages used was reading ability. Since reading lessons occur in the first grade and since first grade classrooms are usually populated by six year olds who have the physical maturity of six year olds, the variables of reading ability, grade level, chronological age and physical maturity usually result in parallel classifications of the children. In the current study, some pre-schoolers were readers and one first grader was designated as readiness so that the grade level and reading ability classifications were not identical. But, for the majority of the sample the two classifications grouped the children similarly. Consequently, performance differences attributed to reading ability could also be attributed to grade level differences, chronological age differences, physical maturity differences, or any combination thereof.

The conclusions drawn from the current study are limited to the available sample that was randomly selected from a restricted geographical area. The results found when rural-suburban children were tested may not have been found if the sample had been selected from an urban population. Since the life experiences of urban children differ from the life experiences of rural-suburban children, results may differ according to the population included in the study. The rural-suburban geographical area may also

be restricted in socio-economic levels. The income levels possible in that geographical area may not represent the range of income levels possible in the United States. Therefore, the results of the current study may not have been found if the sample had included all socio-economic levels possible in the United States.

Although the pre-school population lived in the same geographical area as the elementary school population, any pre-school population differs from an elementary school population. Children are required by law to attend elementary school and so all the children in the area were included in the kindergarten and first grade population from which the sample was randomly selected. In contrast, attendance at pre-school is by parental discretion and so not all children attend. Consequently, the pre-school sample was not selected from all the pre-school children in that area. Therefore, two limitations result. First, the performances given by these pre-school children may be different from performances given by children who do not attend pre-school. Secondly, the pre-school sample may not have been comparable to the kindergarten and first grade sample and so comparisons among the grade levels may not be valid.

Conclusions and interpretations regarding young children's metalinguistic understanding are limited to the definitions of metalinguistic understanding employed in the current study. This study defined metalinguistic understand-

ing in terms of two components of cognitive clarity -- the understanding of linguistic segments, and the understanding of reading terminology. Other definitions of metalinguistic ability and cognitive clarity were not investigated in the research.

The conclusions and interpretations regarding young children's metalinguistic understanding are also limited to the sentences and questions used in the investigation. The segmentation task was composed of eleven sentences. If different lexical items were to compose the sentences, different results may be found. If other sentence types were used, different results may be found. The explanation task used two different questions to probe the children's understanding of reading terms. If a third wording were chosen, the results may change. And the recognition task was composed of randomly selected letters, words, sentences, and numbers. If different items were selected, different results may occur. Thus, the items used to compose each task might have influenced the results and so the conclusions are limited to the specific items included in these metalinguistic tasks.

Procedural factors may also have influenced the results and so must be considered as limitations to the research. One procedural factor is the order in which the metalinguistic tasks were presented. The explanation task was presented first so that performances would not be cued

by the other tasks. But the explanation task could have provided cues for the recognition task which was second. And both of these tasks could have provided cues for the segmentation tasks. (The order effects between the two segmentation tasks were balanced because one-half of the sample was presented the aural segmentation task first while the other half received the visual first.) Thus, the children's performances on subsequent tasks could have been influenced by the previous tasks and so the generalizations regarding their performances must recognize that limitation.

A second procedural factor is that each child was tested individually. The individual testing did allow each subject to be considered as a separate unit. But the time required for individual testing did not make a large sample feasible. Thus, the procedure limited the number of subjects included in the sample. One cannot assume that the results with a small sample will be the same as the results with a large sample.

A third procedural factor is the cumulative effect of task variables on the segmentation task. The task variables of sentence length and position within sentences were found to have influenced the children's performances, while sentence type was not found to have influenced their performances. Since none of the three variables can occur in isolation, the cumulative effect of all three variables might have influenced some children's performances.

With these procedural, sample, and design limitations in mind, the following conclusions can be stated.

## Conclusions

In answer to the basic question asked in this study, young children's metalinguistic understanding does exhibit developmental trends. Having used language functionally in their daily living, young children gradually learn to consider language as an entity which can be discussed and analyzed. When the children were required to divide the visual and aural streams of language into separate words, the children were progressively more able. When the children were required to explain or recognize the technical terms of reading, the children were progressively more successful. The children seemed to be learning the terms in the hierarchial sequence of *letter*, *word*, *sentence*.

The progressive success of the children can be attributed to the grade level differences and the reading ability differences among the children. First graders and readers exhibited the most success on the segmentation tasks and on the reading terminology tasks. The pre-schoolers and the non-readiness children exhibited the least success on the segmentation tasks and on the reading terminology tasks. The kindergarteners and readiness children exhibited success on the tasks concerning the term *letter* and moderate success on the segmentation tasks but they were not successful on the tasks involving the term *sentence*.

The kindergarteners and the readiness children were involved in the process of learning about language as an entity. They met with more success than the naive preschoolers and non-readiness children but they had not yet achieved the understandings that the first graders and the readers had acquired.

From the conclusion that developmental trends exist in children's metalinguistic ability, implications regarding teaching procedures and future research can be stated.

## Implications

The segmentation tasks and the reading terminology tasks presented in this investigation are analogous to activities conducted in kindergarten and first grade classrooms. Consequently, the performances of the children on these tasks have implications for teaching procedures.

The pattern of mastery of the visual and aural segmentation tasks by the children in different grade levels and reading ability groups supports the inference that visual segmentation ability aids performance on the aural segmentation task. McNinch (1974) advocates mastery of his aural segmentation task as a prerequisite for reading instruction. On the contrary, the inference from the current study is to proceed with reading instruction, which provides an emphasis on visual language. The focus on visual language may illuminate the metalinguistic character of language. The learnings from visual language

may then be transferred to aural language.

Most teachers assume that children understand the term word and can recognize an example of the term both in isolation and in context, even though the children may not be able to read the word. Teachers proceed through reading lessons using the term and assuming each child locates the example in his workbook or basal reader. The teachers' assumption is probably incorrect. In the current investigation, pre-schoolers and kindergarteners, who were non-readers, could recognize only an isolated example of the reading term word. Thus, entering first graders probably have little understanding of the term.

Teachers should be aware that their instructional language is unknown to the children.

> It was as though the children never thought to analyze speech but in learning to read had been forced to recognize units and subdivide. The use of words like letter, word, and sentence in teaching was not so much a direct aid to instruction but a challenge to find their meaning. (Francis, 1973, p. 22)

Examples of words, sentences, letters need not be taught in drill fashion. Instead, the concepts may be taught in an inductive manner. The teacher can cite negative and positive instances in conjunction with the appropriate term while completing workbook activities or while reading stories. The children can continue to formulate their own generalizations regarding the referents for the terms in

both isolated and contextual situations. The tea her's awareness that he is teaching the terms may decrease the cognitive confusion of the beginning readers earlier.

The recognition task in this investigation presented a word in an isolated setting, eliminating the necessity of extracting the word from its surroundings. The children may have found the task easy because the task involved only recognition. Similarly, a worksheet or a workbook containing matching or completion exercises presents the words in isolated settings. Thus, beginning readers should easily complete the exercises.

In contrast, the segmentation tasks presented words embedded in aural and visual contexts. The children may have found the tasks more difficult because they had to formulate their own rules for isolation and recognition. The segmentation tasks may be analogous to a language experience story. Although the child knows the content of the story, the child must hypothesize about the exact visual location of the words which she is saying. The greater degree of difficulty involved in the language experience task as opposed to the workbook task probably requires a greater degree of metalinguistic awareness. The greater difficulty of the language experience task may also allow the child to formulate more hypotheses about the metalinguistic nature of language and consequently acquire a richer understanding of language.

When a child misreads a word, the teacher often reads the phrase, the sentence, or the word after the child has finished the sentence. Can the child actually locate the visual instance of the teacher's aural word? When one child reads aloud and the other children silently read or follow along in their books, can the followers locate and match the visual instances of the oral reader's words? This research indicates that children may not be able to segment either the teacher's or the oral reader's aural rendition properly in order to begin to match a visual word. Thus, round robin reading in a group is not a profitable teaching procedure. And, when correcting a reading error, the teacher needs to carefully alter his speech pattern and to point to the visual image of the aural word he is saying. A teacher cannot rely on a child's skills to match a word in the aural and visual contexts.

Implications for future research can also be stated. Downing,Ollida, Evanechko and Braun have included a recognition task for the terms letter, word and number, and a visual segmentation task in the preliminary form of the Canadian Reading Readiness Test (Downing, Ollida, Evanechko and Braun, 1976). A child who could recognize an isolated example of the terms and who could segment a printed sentence would be demonstrating two different components of metalinguistic ability. However, the appropriateness of the two tasks as predictive tools for reading needs to be

examined further.

In the current study, the children mastered the visual context of the segmentation task before or in conjunction with the aural context. If the inference can be made that learnings of visual language are transferred to aural language, then the reading program which the child encounters in the first grade may influence the child's metalinguistic understanding. Depending upon the specific reading program, the initial emphasis may be on sight words (Reading 720 published by Ginn), or on letter-sound-correspondences (Basic Reading published by Lippincott) or on meaningful sentences and stories (the language experience approach). Research should be conducted to describe the influence of the different initial emphases of the reading programs on how children learn to define a word and to segment a sentence.

One would predict that an emphasis on letter-sound-correspondences would lead to a hypothesis that individual letters are words (an error pattern in the current study). Also, one would predict that the language experience approach would lead to a hypothesis that sentences are words (another error pattern in the current study). Children who become readers alter these initial hypotheses. Do children who are having difficulty in learning to read alter their initial hypotheses? If a reading program with a different initial emphasis was used with the struggling learners,

would the children subsequently alter their initial hypotheses? Thus, the research would clarify the role of the initial emphasis of a reading program on the development of an understanding of the task of reading.

In this investigation, readers are able to perform better on the metalinguistic tasks. Is an inference that disabled readers will perform poorly on the metalinguistic tasks justified? Vernon (1971) stated that disabled readers exhibited cognitive confusion regarding the reading task. How do children classified as having a reading disability perform on the metalinguistic (cognitive clarity) tasks included in the current research? If reading disabled children perform similarly to non-readiness children and exhibit a differential context effect, support would be given for the cognitive confusion theory of reading disability.

In the current research, reading ability was confounded by grade level or experience with oral language. Most of the readers in the study also were in the first grade and thus probably also had the most speaking-listening experience. Thus, the current study cannot conclude that reading ability was the determining factor for increased metalinguistic ability. One can only infer that learning about visual language will aid learning about aural language. A study examining the performance of illiterate adults, who have extensive experience with

aural language but minimal experience with visual language, could help clarify the contribution of aural language experience. If visual language experience was a crucial determinant for metalinguistic ability, the illiterate adults should perform similarly to the pre-schoolers. If experience with aural language is a contributor to metalinguistic ability, then illiterate adults' performances would not be different than readers.

An implication drawn from this investigation for teaching procedures was that inductive teaching of metalinguistic concepts might reduce the cognitive confusion of beginning readers. Research should be conducted to determine whether a teacher's conscious inclusion of contextual and isolated examples in conjunction with the conscious use of reading terms in lessons would result in increased metalinguistic awareness on the part of the children. Would the students of a metalinguistically aware teacher perform differently from students of a metalinguistically unaware teacher?

Children's consciousness of language or their metalinguistic ability has only recently been examined. The current study investigated only two operational definitions of metalinguistic ability -- the concept of the linguistic segment word and the understanding of reading terminology. Glietman, Glietman and Shipley (1972) investigated children's metalinguistic ability in terms of

the recognition of grammatical and ungrammatical sentences. Other areas of metalinguistic ability need investigation.

Metalinguistic ability could be examined utilizing tasks related to two other components of cognitive clarity. First, the recognition and understanding of the communicative purpose of language could be investigated. When do children recognize that language is used to communicate ideas, wants, needs? In aural language, do they understand the differences in the communication purposes of singing to oneself in contrast to asking for a cookie? In visual language, do they understand the purpose of a billboard or a highway sign? Second, metalinguistic ability could be investigated utilizing the cognitive clarity component of the function of symbols. When do codes become important to children? Can they distinguish between the symbollic function of the international sign for no smoking and a scribble? Investigations into children's understanding of the communicative purpose of language and the function of symbols would enrich our knowledge of children's metalinguistic ability.

And finally, the cross-sectional research design used in the current study is the design used in the majority of the research on education. A study using a longitudinal research design needs to be conducted to collaborate or refute the developmental trends found when children's understanding of the linguistic segment "word" and when children's understanding of reading terminology were in-

vestigated using a cross-sectional research design.

## REFERENCES


Bloomfield, L. Language. New York: Holt, Rinehart and Winston, Inc., 1933.

Bloomfield, L. A set of postulates for the science of language. In S. Saporta (Ed.), Psycholinguistics: a book of readings. New York: Holt, Rinehart and Winston, Inc., 1961, pp. 26-33.

Clay, M. M. Reading errors and self-correction behavior. British Journal of Psychology, 1969, 39, 47-56.

Dale, E. Dale list of 3000 familiar words. In E. Dale and J. S. Chall. A formula for predicting readability. Educational Research Bulletin, 1948, 27, 11-20.

Dale, P. S. Language Development, second edition. New York: Holt, Rinehart and Winston, 1976.

Downing, J. The implications of research on children's thinking for the early stages of learning to read. In M. P. Douglass, (Ed.), Claremont reading conference, thirty-second yearbook. Claremont, Calif.: Claremont University Center, 1968.

Downing, J. Children's concepts of language in learning to read. Educational Research, 1969-1970, 12, 106-112.

Downing, J. The development of linguistic concepts in children's thinking. Research in the Teaching of English, 1970, 4, 5-19.

Downing, J. and Thackray, D. V. Reading readiness. London: University of London Press, Ltd., 1971a, 63-66.

Downing, J. Specific cognitive factors in the reading process. In Frank P. Greene, (Ed.), Reading: the right to participate, twentieth yearbook of the National Reading Conference. Milwaukee, Wisconsin: National Reading Conference, Inc., 1971b, 38-45.

Downing, J. How children develop concepts of language. In Carl Braun, (Ed.), Language, reading and the communication process. Newark, Del.: International Reading Association, 1971c, 113-120.

Downing, J. Children's developing concepts of spoken and written language. Journal of Reading Behavior, 1971-1972, 4 (1), 1-19.

Downing, J. A summary of evidence relating to the cognitive clarity theory of reading. In Phil L. Nacke (Ed.), Diversity in mature reading: theory and research, twenty-second yearbook, Vol. I, National Reading Conference. Boone, N.C.: The National Reading Conference, Inc., 1973, 178-184.

Downing, J. and Oliver, P. The child's conception of a 'word'. Reading Research Quarterly, 1973-1974, 9 (4) 568-582.

Downing, J., Ollila, L., Evanechko and Braun. Canadian Reading Readiness Test. Preliminary form, 1976, unpublished. Copies available from L. Ollila, University of Victoria, British Columbia, Canada.

Durkin, D. Children who read early. New York: Teachers College Press, 1966.

Ehri, L. C. Word consciousness in readers and pre-readers. Journal of Educational Psychology, 1975, 67 (2), 204-212.

Figa, L. E. Empirical factors involving the perception of oral and written word unit segmentation by first grade children (Doctoral Dissertation, University of Georgia, 1972). Dissertation Abstracts International, 1973, 33 (7), 3378-A. (University Microfilms No. 72-34, 069).

Francis, H. Children's experience of reading and notions of units of language. British Journal of Educational Psychology, 1973, 43 (1), 17-23.

Gleason, H. A., Jr. An introduction to descriptive linguistics, (Revised edition). New York: Holt, Rinehart and Winston, Inc., 1955.

Gleitman, L. R., Gleitman, H. and Shipley, E. The emergence of the child as grammarian. Cognition, 1972, 1, 137-164.

Harty, K. A Comparative Analysis of Children Who Enter Kindergarten Reading and Children of the Same Age Who Require Additional Readiness for Reading. Unpublished doctoral dissertation, University of Wisconsin-Madison, 1975.

Hockett, C. F. A course in modern linguistics. New York; MacMillan Co., 1958.

Holden, H. and MacGinitie, H. Children's conceptions of word boundaries in speech and print. Journal of Educational Psychology, 1972, 63 (6), 551-557.

Holden, H. Metalinguistic Performance and Cognitive Development (Doctoral Dissertation, Columbia University, 1972). Dissertation Abstracts International, 1972, 33 (6), 2791B-2792B. (University Microfilms No. 72-31, 214).

Holden, H. and MacGinitie, H. Metalinguistic ability and cognitive performance in children from five to seven. Paper presented at the meeting of the American Educational Research Association. New Orleans, February, 1973.

Huttenlocher, J. Children's language: word-phrase relationship. Science, 1964, 143, 264-265.

Johnson, D. D. A basic vocabulary for beginning readers. The Elementary School Journal, 1971, 72, 21-34.

Johnson, D. D. and Majer, E. Grade level recognition of Johnson's basic vocabulary for beginning reading. The Elementary School Journal, 1976, 77 (1) 74-82.

Johnson, D. D. Informal diagnostic reading test. In R. Smith and D. D. Johnson. Teaching children to read. Reading, Mass.: Addison-Wesley Publishing Co., 1976, pp. 213-221.

Karpova, S. N. Osoznanie slovesnogo sostava richi rebenkom dishkol'nogo vozrasts (The pre-schooler's realization of the lexical structure of speech), Voprosy Psikhol., 1955, No. 4, 43-55. Translated by Dan I. Slobin, Abstracts of Soviet studies of child language. In F. Smith and G. Miller (Eds.), The genesis of language: a psycholinguistic approach. Cambridge: The M.I.T. Press, 1966, 370-371.

Kingston, J., Weaver, W. W., and Figa, E. Experiments in children's perceptions of words and word boundaries. In Frank P. Greene, (Ed.), Investigations related to mature reading, twenty-first yearbook of the National Reading Conference, Milwaukee, Wisconsin: The National Reading Conference, Inc., 1972, 91-99.

Kirk, E. Experimental design: procedures for the behavioral sciences. Belmont, Calif.: Wadsworth Publishing Co., Inc., 1968.

Kramsky, J. The word as a linguistic unit. The Hague: Mouton and Co., 1969.

Landsdown, R. and Davis, V. The language of reading and the ESN child. Reading, 1972, 6 (2), 21-24.

McNinch, G. Awareness of aural and visual word boundary within a sample of first graders. Perceptual and Motor Skills, 1974, 38, 1127-1134.

Meltzer, N. S. and Herse, R. The boundaries of written words as seen by first graders. Journal of Reading Behavior, 1969, 1 (3), 3-14.

Michish, V. Children's perception of written word boundaries. Journal of Reading Behavior, 1974, 6 (1) 19-22.

Quirk, R. and Greenbaum, S. A concise grammar of contemporary english. New York: Harcourt Brace Jovanovich, Inc., 1973.

Reid, J. F. Learning to think about reading. Educational Research, 1966, 9 (1), 56-62.

Rozin, P. and Gleitman, L. R. The structure and acquisition of reading II: the reading process and the acquisition of the alphabetic principle. In A. S. Reber and D. L. Scarborough (Eds.), Toward a psychology of reading. Hillsdale, N.J.: Lawrence Erlbaum Assoc., 1977.

Vernon, M. D. Reading and its difficulties: a psychological study. Cambridge: Cambridge University Press, 1971.

Vygotsky, L. Thought and language. Edited and translated by Eugenia Hanfmann and Gertrude Vakar. Cambridge: The M.I.T. Press, 1962.

# APPENDIX A

## THE CONTENT OF THE INFORMAL READING ABILITY PROCEDURE

1. Twenty-six letters of the alphabet.

2. Five words: "big," "up," "look," "good," "to".

3. Two sentences: Look up at me.
   It is a big dog.

# APPENDIX B

## THE SENTENCES USED IN THE SEGMENTATION TASKS

### Practice Sentences

| | |
|---|---|
| Subject-verb type: | Timmy spilled.<br>The puppies are running. |

### Test Sentences

| | |
|---|---|
| Subject-verb type: | A dog barked.<br>The happy children are skipping. |
| Subject-verb-complement type: | Ted is lost.<br>The gray elephant is funny. |
| Subject-verb-object type: | Sally throws a ball.<br>My surprise is a birthday cake. |
| Subject-verb-object-object type: | Mommy gave me a kitten.<br>Freddy asked me a question.<br>Tom drew a pretty picture for me. |
| Command type: | Help Daddy.<br>Tell me a fairy tale. |

# APPENDIX C

## TRANSCRIPTION OF THE FOUR TAPES OF THE SENTENCES USED FOR THE AURAL CONTEXT SEGMENTATION TASK

Tape 1

(Practice Sentences)

Timmy spilled.
The puppies are running.

(Test Sentences)

Tom drew a pretty picture for me.
Freddy asked me a question.
Mommy gave me a kitten.
Help Daddy.
Ted is lost.
Sally throws a ball.
The gray elephant is funny.
My surprise is a birthday cake.
A dog barked.
Tell me a fairy tale.
The happy children are skipping.

Tape 2

(Practice Sentences)

Timmy spilled.
The puppies are running.

(Test Sentences)

The happy children are skipping.
Sally throws a ball.
Mommy gave me a kitten.
The gray elephant is funny.
Tom drew a pretty picture for me.
Tell me a fairy tale.
Freddy asked me a question.
Ted is lost.
A dog barked.
Help Daddy.
My surprise is a birthday cake.

APPENDIX C (cont.)

Tape 3

(Practice Sentences)

Timmy spilled.
The puppies are running.

(Test Sentences)

The gray elephant is funny.
Sally throws a ball.
Tell me a fairy tale.
My surprise is a birthday cake.
A dog barked.
Ted is lost.
The happy children are skipping.
Freddy asked me a question.
Help Daddy.
Mommy gave me a kitten.
Tom drew a pretty picture for me.

Tape 4

(Practice Sentences)

Timmy spilled.
The puppies are running.

(Test Sentences)

Help Daddy.
My surprise is a birthday cake.
A dog barked.
The happy children are skipping.
Sally throws a ball.
Ted is lost.
The gray elephant is funny.
Mommy gave me a kitten.
Tom drew a pretty picture for me.
Freddy asked me a question.
Tell me a fairy tale.

# APPENDIX D

## A RANDOM ORDER OF SENTENCES USED FOR THE VISUAL CONTEXT SEGMENTATION TASK

### Practice Sentence Strips

Timmy spilled.
The puppies are running.

### Test Sentence Strips

Help Daddy.
My surprise is a birthday cake.
A dog barked.
The happy children are skipping.
Sally throws a ball.
Ted is lost.
The gray elephant is funny.
Mommy gave me a kitten.
Tom drew a pretty picture for me.
Freddy asked me a question.
Tell me a fairy tale.

# APPENDIX E

## QUESTIONS USED FOR THE EXPLANATION OF READING TERMINOLOGY TASK

1. What is a letter?
   How do we use letters?
   Tell me any letter you know.

2. What is a word?
   How do we use words?
   Tell me any word you know.

3. What is a sentence?
   How do we use sentences?
   Tell me any sentence you know.

# APPENDIX F

## RESPONSE ARRAY USED FOR THE RECOGNITION OF READING TERMINOLOGY TASK

| | | |
|---|---|---|
| Letters: | m | n |
| Words: | never | there |
| Sentences: | The children run. | The girl is going home. |
| Numbers: | 3 | 6 |